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Water-Borne Typhoid Fever Still a Menace*

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THE phenomenal decline in the typhoid fever death rate in North America and Europe since the beginning of the 20th century is well known to every health and water works official. Its general trend in the United States is indicated in the 5-year rate table for the U. S. Registration Area:

Year	Deaths per 100,000
1900	35.8
1905	27.9
1910	23.5
1915	12.8
1920	7.9
1925	8.0
1928	4.9

The knowledge of this statistical decrease has unfortunately developed in many places among health and water works officials, and even the general public, an element of tolerance toward this disease and a laxity in control measures which constitute a potential public health hazard. It may be true that as control and preventive measures become better perfected, the cost of carrying them on may be decreased and money may economically be diverted to other public health work. But laxity in control, especially of milk and water, is likely to be reflected in sudden and intense outbreaks of large proportions.

For example, in spite of the rapidly declining typhoid fever death

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rate on this continent and in Europe, 3 of the largest epidemics on record occurred in the last decade:

TABLE I

Place	Population	Date	Typhoid Fever Cases	Deaths	Infection
Hanover, Germany	427,280	Sept.–Dec., 1926	2,423	545	Water Borne
Lyons, France	600,000*	Jan.–Feb., 1929	2,143*	45*	" "
Montreal, Canada	600,000	March–July, 1927	5,014	488	Milk "

* Incomplete record.

The question might well be asked—If typhoid fever is likely to become almost extinct in the present and coming generations in large centers of population, will a lessened immunity result? If so, in the future outbreaks of this disease, are we likely to have a mortality rate much higher than ever before? If such is the probability and explosive outbreaks of the nature of the 3 cited can occur at this late date, when the arts of water purification and dairy sanitation have reached such a high degree of development, something must be wrong with the control measures.

TABLE II

Year	Outbreaks	Typhoid Fever Cases	Typhoid Fever Deaths	Dysentery Cases	Total Persons Affected—Typhoid and Dysentery Cases
		United States			
1920	26	2,003	133	8,112	10,115
1921	29	550	30	2,899	3,449
1922	20	563	60	800	1,363
1923	24	1,168	119	320	1,488
1924	23	1,039	70	10,611	11,650
1925	24	1,359	16	4,714	6,073
1926	21	849	42	45,143	45,992
1927	30	486	51	1,208	1,694
1928	19	502	33	2,883	3,385
1929	26	848	76	7,655	8,503
Total	242	9,367	630	84,345	93,712
		Canada			
1920	4	327	2		327
1921	4	149	11		149
1922	4	111	0		111
1923	10	1,366	95		1,366
1924	5	170	14		170
1925	1	32	4		32
1926	0	0	0		0
1927	4	311	6		311
1928	2	79	0		79
1929	6	291	13		291
Total	40	2,836	145		2,836

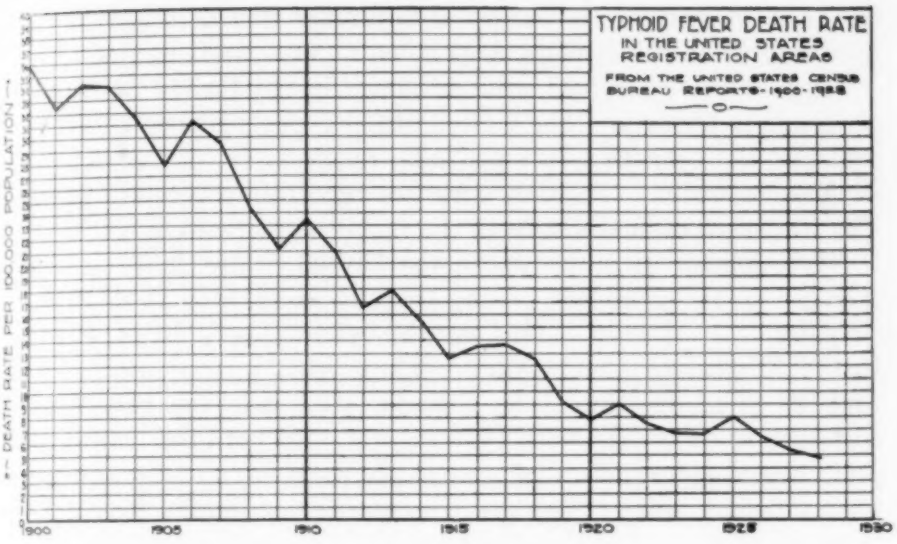

FIGURE I

The control is primarily a responsibility of the health officer, for in a large percentage of cases he has the police power which the courts will sustain. He can insist on the elimination of potentially dangerous conditions and the exercise of the necessary precautionary control measures to provide against emergencies, which might be anticipated, provided reasonable inspection is maintained and recognized standards of performance are enforced.

In order to obtain facts concerning water-borne outbreaks in Canada and the United States and their relationship to the factors over which public health and water works officials have jurisdiction and control, we have made a careful study of the outbreaks which have occurred during the last decade in these countries.

Figure I shows the marked decline in the typhoid fever death rate in the U. S. Registration Area for this decade, which opened with a rate of 35.8 and showed a steady decline to 4.9 per 100,000 in 1928, with the exception of the year 1925. For this year nearly one-third of the states reported increases in their typhoid death rates.

The decade 1920–1929 was selected as representing an era in which knowledge was available for adequate purification of water supplies and for proper protection of these supplies against those hazards reasonably and practicably susceptible to control. The information was obtained from the various state and provincial health departments whose courteous and complete coöperation is herewith acknowledged. These reports were studied, particularly with ref-

erence to identifying the causes of outbreaks and determining therefrom where control measures had failed or were most needed.

Reports were received from 47 states in the United States and 6 provinces in Canada. The United States reports represent 98.65 per cent and the Canadian 79.5 per cent, respectively, of the population of these countries. The only state not reporting was South Carolina. The investigation brought forth the facts summarized in Table II.

The number of outbreaks in the United States shows a distinct increase for the year 1927, rising from 21 in 1926 to 31 in 1927 and dropping to 19 in 1928. This was the year of heavy floods, especially in the Mississippi River valley. These high waters affected water supplies in many states. In Canada, 1923 was the high year for water-borne outbreaks, with 1926 the low. In both the United States and Canada there was an increase in the number of outbreaks in 1929 over previous years. The greatest number of deaths from typhoid fever occurred for the United States in 1920 and for Canada in 1923, reflecting the well known water-borne epidemics at Salem, O., and Cochrane, Ont., respectively.

In Table III the distribution of the 282 outbreaks into population groups indicates, as might be expected, that the larger number occurred in the small cities.

TABLE III

OUTBREAKS OF WATER-BORNE DISEASES IN THE UNITED STATES AND CANADA, CLASSIFIED AS TO POPULATION GROUPS AFFECTED—DECADE 1920–1929

United States

Population	Number of Outbreaks	Per Cent of Outbreaks
1,000 and under	68	28.1
1,000 to 5,000	89	36.8
5,000 to 10,000	30	12.4
10,000 to 25,000	29	12.0
25,000 to 50,000	11	4.6
50,000 to 100,000	6	2.5
100,000 to 500,000	7	2.8
500,000 to 1,000,000	0	0.0
Over 1,000,000	2	0.8
	242	100.0

Canada

1,000 and under	6	15.0
1,000 to 5,000	25	62.5
5,000 to 10,000	4	10.0
10,000 to 25,000	5	12.5
	40	100.0

Of the outbreaks in the United States 64.9 per cent, and of those in Canada 77.5 per cent, were in cities having a population of under 5,000. In both countries this appears to be the group needing the greatest attention and supervision. In the United States 4 of the 10 largest typhoid outbreaks and 5 of the 10 largest dysentery outbreaks of the decade occurred in cities of this group. In Canada 8 of the largest typhoid outbreaks were in cities of this group. These facts indicate a distinct need for better supervision over water supplies of the small and moderately small towns.

While we are emphasizing the need for better control in the smaller towns we should, however, note that 2 outbreaks occurred in cities having a population of over one million, where it may be presumed adequate finances were available to provide strict supervision over the quality of the public water supply.

For the purpose of this study the causes of these outbreaks were classified into 7 major groups each with minor subdivisions, making a total of 26 causes. Of these 7 major classifications, 6 relate to points in the water works system from the source of supply to the consumer's tap. The 7th includes a miscellaneous group not readily classified elsewhere. The classification is shown in Table IV A.

Table IV summarizes these findings and presents information worthy of careful study by health and water works officials.

The largest number of outbreaks in both the United States and Canada was due to the use of untreated surface water supplies. This was to be expected if one bears in mind the widespread pollution of surface water in these countries. In the United States the second largest number of outbreaks—57—was caused by the use of untreated ground water. In a majority of these—30—the sources were shallow wells polluted from surface sources.

It is worthy of note that, whereas the use of untreated surface and well water was responsible for 52.1 per cent and 55 per cent of the outbreaks in the United States and Canada respectively, the percentage of total typhoid fever cases in Canada due to the use of raw water was almost twice that in the United States—64.1 to 33.3.

One of the most important and significant findings in this study is the fact that in the United States, and to a lesser degree in Canada, water-borne outbreaks during the past decade have been due almost as much to laxity in handling water from its source to the consumer as to the use of water from polluted sources. This is a strong indictment of our methods of supervision and control and deserves very serious consideration by health and water works officials. In the United States, excluding the 14 outbreaks for which the cause is unknown,

TABLE IV

CLASSIFICATION OF WATER-BORNE OUTBREAKS IN THE UNITED STATES AND CANADA 1920–1929 INCLUSIVE, AS TO POINT OF POLLUTION IN WATER WORKS SYSTEM

United States

Classification	Out-breaks	Per Cent	Cases of Typhoid	Per Cent	Cases of Dysentery	Per Cent	Total Cases of Typhoid and Dysentery	Per Cent
Untreated Surface Water Supplies	69	28.5	1,506	16.0	590	0.7	2,156	2.3
Untreated Ground Water Supplies	57	23.6	1,606	17.3	13,936	16.5	15,542	16.6
Contamination of Reservoirs and Cisterns	5	2.1	68	0.7	1,269	1.5	1,337	1.4
Inadequate Control Over Water Purification Methods	49	20.2	1,975	21.1	48,725	57.8	50,700	54.1
Contamination in Distribution System	31	12.8	2,055	21.9	6,535	7.8	8,590	9.2
Contamination in Collection or Conduit System	17	7.0	1,883	20.1	11,840	14.0	13,723	14.7
Miscellaneous	14	5.8	274	2.9	1,450	1.7	1,664	1.7
Totals	242	100.0	9,367	100.0	84,345	100.0	93,712	100.0

Canada

Untreated Surface Water Supplies	19	47.5	1,818	64.1
Untreated Ground Water Supplies	3	7.5	45	1.6
Contamination of Reservoirs and Cisterns	1	2.5	42	1.5
Inadequate Control Over Water Purification Methods	8	20.0	433	15.3
Contamination in Distribution System	6	15.0	214	7.5
Contamination in Collection or Conduit System	3	7.5	284	10.0
Totals	40	100.0	2,836	100.0

the records show that 102 of a total of 228 outbreaks, or 44.7 per cent, were due to contamination occurring in the collection, delivery, or storage, or laxity in treatment. For Canada this percentage is 40.5.

The indications are that, in a high percentage of these cases, outbreaks could have been prevented by adequate inspection and control measures. Perhaps the most obvious case reported is that of one of

TABLE IV A

CLASSIFICATION OF CAUSES FOR WATER-BORNE TYPHOID FEVER FOR THE UNITED STATES AND CANADA DURING THE DECADE 1920–1929 INCLUSIVE

A. *Surface Water Supplies—*
1. Contamination of brook or stream by pollution on watershed
2. Use of polluted river water—untreated
3. Use of polluted lake water—untreated
4. Contamination of spring well or infiltration gallery by pollution on watershed
5. Contamination of spring well or infiltration gallery by flood waters

B. *Underground Water Supplies—*
1. Surface pollution of shallow wells
2. Faulty well casing or construction
3. Pollution of deep well from adjacent river or lake
4. Pollution of well from adjacent sewer or sewage tank
5. Underground pollution of well or spring in creviced limestone
6. Underground pollution of well or spring, source unknown
7. Underground pollution of well by surface contamination through abandoned well
8. Overflow of sewer or flood water into top of well casing

C. *Reservoirs or Cistern Storage—*
1. Seepage from sewer or surface into cracked cistern or reservoir

D. *Water Purification—*
1. Inadequate control of filtration and allied treatment
2. Inadequate chlorination—when only treatment
3. Interruption of chlorination—when only treatment

F. *Distribution System—*
1. Pollution of water mains during construction or repairs
2. Leaking water and sewer in same trench
3. Cross-connection with polluted water supply
4. Break in supply main in river crossing

G. *Collection or Conduit System—*
1. Auxiliary intakes to polluted source
2. Seepage of surface water or sewage into gravity conduit

H. *Miscellaneous—*
1. Use of polluted private supply because of objectionable taste or quality of public supply
2. Use of polluted water not intended for drinking purposes
3. Cause of outbreak undetermined
4. Data insufficient for classification

America's largest cities, Detroit, where in spite of the fact that the city was equipped with one of the most modern rapid sand filtration plants, in February, 1926, it suffered an outbreak of water-borne dysentery amounting to at least 45,000 to 50,000 cases.

A balanced picture of the situation cannot, however, be obtained from a study of the number of outbreaks. Let us analyze the data by persons affected as indicated in the cases of typhoid and dysentery reported. Of the typhoid cases 43.7 per cent, and of the dysentery cases 66.1 per cent, were due primarily not to the use of polluted water at its source, but to laxity in source treatment or distribution methods.

It is, of course, a recognized fact that the use of surface or ground waters subject to pollution and without adequate purification treatment is an invitation to water-borne outbreaks. But when water is

known to be polluted and in consequence of this purification methods have been provided, is it not a serious reflection on both water works and health officials to have outbreaks of typhoid fever and dysentery occur? In the United States 2,055 cases of typhoid fever occurred because of pollution of an apparently safe water as it was being distributed to the consumer. Of these, 1,995, or over 95 per cent, were due to unprotected cross-connections with polluted water supplies. Among these were the disastrous outbreaks at Winona Lake and Fort Wayne, Ind., and Bloomington, Ill.

Inadequate control over purification methods accounted for 1,925 cases. Of these, 395 were cases where treatment consisted of filtration and chlorination—a combination capable of giving protection against heavily polluted water if efficiently operated. Inadequate chlorination, where this treatment was the sole protection, was responsible for 985 cases. This clearly indicates lack of proper control measures. Among these outbreaks were those at Newport and Covington, Ky., Akron, N. Y., Delaware, O., and Salt Lake City, Utah. In the residual chlorine test, plant operators have at their command an effective method of controlling chlorination to give complete public health protection. With proper control measures all of these cases could have been prevented.

Seventeen outbreaks in the United States, representing 594 cases of typhoid fever, were due to interruption in chlorination where this was the only safeguard against contamination. In 6 instances the chlorinator was out of order and in the others it had been shut down. In Pittsburg, Calif., Alpena, Mich., and Greeneville, Tenn., were the outstanding outbreaks of this group. The reliance on one chlorinator where chlorination is the sole line of defense against a potentially dangerous water supply has always been considered a serious error, but the shut-down of chlorination under these circumstances is little short of criminal negligence. These are facts which health and water works officials must face, for the responsibility is theirs.

The number of typhoid fever and dysentery cases resulting from contamination in the system for collection and transmission of raw water was high in both the United States and Canada. Auxiliary intakes were responsible for 4 outbreaks in the United States, representing 2,300 dysentery and 69 typhoid cases. Sewage pollution of gravity conduits or breaks in suction lines caused 13 outbreaks, 9,540 cases of dysentery and 1,814 of typhoid fever. The use of vitrified tile pipe for gravity transmission of water took a heavy toll. This group included the classic Salem, O., epidemic, the Brigham, Utah, typhoid outbreak, and the Greenville, Ill., dysentery outbreak.

TABLE V

RELATIVE MAGNITUDE OF WATER-BORNE OUTBREAKS 1920–1929 INCLUSIVE

United States

Rank	Class	No. of Outbreaks	Rank	Cases of Typhoid Fever	Rank	Cases of Dysentery	Rank	Persons Affected Total Typhoid and Dysentery Cases
1	B 1	30	4	660	6	2,005	5	2,665
2	F 3	29	1	1,995	4	6,535	4	8,530
3	A 2	21	10	340	14	185	14	525
4	A 1	21	6	510	17	0	15	510
5	D 3	17	5	595	15	32	11	626
6	D 1	17	8	396	1	47,311	1	47,707
7	A 4	16	7	454	16	5	16	459
8	D 2	15	3	985	7	1,382	7	2,367
9	G 2	13	2	1,814	3	9,540	2	11,354
10	B 5	10	11	289	9	1,089	8	1,378
11	A 5	7	13	123	12	400	13	523
12	H 3	5	19	60	10	600	10	660
13	H 4	5	20	54	11	500	12	554
14	C 1	5	18	68	8	1,269	9	1,337
15	B 8	5	9	381	2	10,650	3	11,031
16	B 2	4	23	20	13	192	17	212
17	A 3	4	14	79	17	0	20	79
18	G 1	4	17	69	5	2,300	6	2,369
19	B 6	3	12	133	17	0	18	133
20	B 7	3	21	50	17	0	23	50
21	B 4	2	15	73	17	0	21	73
22	H 1	2	14	90	17	0	19	90
23	H 2	2	16	70	13	350	22	70
24	F 1	1	24	13	17	0	25	13
25	F 2	1	22	47	17	0	24	47
26	B 3	0	25	0	17	0	26	0
Total		242		9,367		84,345		93,712

RELATIVE MAGNITUDE OF WATER-BORNE OUTBREAKS—DECADE 1920–1929 INCLUSIVE

Canada

Rank	Class	No. of Outbreaks	Rank	Cases of Typhoid Fever	Rank	Deaths
1	A 2	10	2	590	3	13
2	A 1	6	4	285	4	11
3	D 2	4	7	113	5	9
4	F 3	4	6	166	6	8
5	A 3	3	1	943	1	70
6	B 1	2	14	20	11	1
7	D 1	2	10	32	8	4
8	D 3	2	3	288	2	20
9	G 1	2	5	228	10	2
10	B 5	1	12	25	–	–
11	C 1	1	9	42	–	–
12	F 1	1	11	27	9	2
13	F 4	1	13	21	–	–
14	G 2	1	8	56	7	5
		40		2,835		145

Breaks in suction lines were responsible for 2 outbreaks at Grand Forks, N. D., and the well known Olean, N. Y., epidemic. In Canada, 3 outbreaks were due to the use of auxiliary intakes and 1, the Kingsville typhoid outbreak, was due to a break in the intake pipe.

The contamination of water in storage in reservoirs and cisterns caused 5 outbreaks in the United States and 3 in Canada. In 4 of those in the United States there were 1,269 cases of dysentery. The largest one was at Marseilles, Ill., where leakage from a polluted stream adjacent to a storage reservoir caused 700 cases; a second at Canton, Mo., resulted in 500 cases of dysentery, 42 of typhoid fever, and 3 deaths.

RELATIVE MAGNITUDE OF WATER-BORNE OUTBREAKS AND THEIR CONTRIBUTING CAUSES

To permit study of the relative importance of various contributing causes of water-borne outbreaks by their number and cases of typhoid fever and dysentery resulting, this information has been arranged statistically in Tables V and VI.

While the greatest number of outbreaks in the United States were due to drinking water from shallow wells, unprotected cross-connections and inadequate control over purification methods, however, account for the largest numbers of cases of typhoid fever and dysentery respectively. The public health importance of unprotected cross-connections is further emphasized by the fact that this rated second in causes for total outbreaks and fourth in dysentery cases. From these figures it might well be classed as the outstanding public health danger in water works operations.

Considering the number of persons affected, failures in purification methods lead the list; but in using this figure of 47,707 persons affected, it must be remembered that 45,000 of these were cases of dysentery in one outbreak in Detroit in 1926. Second in importance, as to total number of persons affected, is water in transmission through tile gravity conduits. This is a dangerous practice, and both water works and health officials should insist upon its discontinuance. The unprotected cross-connection hazard comes third in order of persons affected, and the use of water from shallow wells is fourth.

In Canada, polluted surface waters, inadequate control over purification methods, and unprotected cross-connections are the most important factors requiring the attention of health and water works officials.

Of the 47 states from which reports were received, 9 had no water-borne outbreaks. This does not mean that there was no typhoid fever in these states during this decade, but that there were no outbreaks of

TABLE VI

RECAPITULATION OF TEN PRINCIPAL CAUSES OF WATER-BORNE OUTBREAKS—DECADE 1920–1929

United States

Outbreaks		Cases of Typhoid Fever			Cases of Dysentery			Persons Affected		
Cause	Number	Rank	Cause	Number	Rank	Cause	Number	Rank	Cause	Number
B 1	30	1	F 3	1,995	1	D 1	47,311	1	D 1	47,707
F 3	29	2	G 2	1,814	2	B 8	10,650	2	G 2	11,354
A 2	21	3	D 2	985	3	G 2	9,540	3	B 8	11,031
A 1	19	4	B 1	660	4	F 3	6,535	4	F 3	8,530
D 3	17	5	D 3	595	5	G 1	2,300	5	B 1	2,665
D 1	17	6	A 1	510	6	B 1	2,005	6	G 1	2,369
A 4	16	7	A 4	454	7	D 2	1,382	7	D 2	2,367
D 2	15	8	D 1	396	8	C 1	1,269	8	B 5	1,378
G 2	13	9	B 8	381	9	B 5	1,089	9	C 1	1,337
B 5	10	10	A 4	340	10	H 3	600	10	H 3	660
	186			8,130			82,681			89,398

$\%\ \text{Total} = \frac{186}{242} = 76.9$ $\%\ \text{Total} = \frac{8,130}{9,367} = 96.9$ $\%\ \text{Total} = \frac{82,681}{84,345} = 98.2$ $\%\ \text{Total} = \frac{89,398}{93,712} = 95.4$

Canada

A 2	10	1	A 3	943
A 1	6	2	A 2	590
D 2	4	3	D 3	288
F 3	4	4	A 1	285
A 3	3	5	G 1	228
B 1	2	6	F 3	166
D 1	2	7	D 2	113
D 3	2	8	G 2	56
G 1	2	9	C 1	42
B 5	1	10	D 2	32
	36			2,743

$\%\ \text{Total} = \frac{36}{40} = 90$ $\%\ \text{Total} = \frac{2,743}{2,836} = 96.8$

any magnitude in a single locality for the decade. They are: Arkansas, Colorado, Connecticut, Delaware, Florida, Louisiana, Massachusetts, New Hampshire, and Nevada.

Wyoming reports 609 cases and 139 deaths from typhoid fever for the decade. They were not classified as to cause and therefore could not be included in this statistical summary. It is reported that practically all of these were water-borne and occurred in Big Horn County due to drinking water from the Shoshoni River, on the watershed of which an increasing number of tourists have resided during summer months.

THE LARGEST WATER-BORNE OUTBREAKS

In Tables VII and VIII statistics are given of the 25 largest water-borne typhoid fever and dysentery outbreaks of the decade in the

TABLE VII

25 LARGEST REPORTED TYPHOID WATER-BORNE OUTBREAKS IN UNITED STATES DURING THE DECADE 1920–1929 INCLUSIVE IN ORDER OF MAGNITUDE

Town	State	Month	Year	Population	Cases	Deaths
Winona Lake	Indiana	July	1925		1,000	?
Salem	Ohio	Aug.–Jan.	1920–21	10,305	884	27
Santa Ana	California	Jan.–Feb.	1924	30,000	369	28
Akron	New York	Aug.–Nov.	1926	3,100	284	18
Olean	New York	Sept.–Oct.	1928	21,400	245	15
Brigham City	Utah	July–Sept.	1923	4,200	230	15
Helena	Montana	Sept.	1929	12,000	205	17
Bloomington	Illinois	Jan.	1920	28,725	200	24
Chicago	Illinois	Nov.	1923	2,701,705	150	15
Pittsburg	California	May–June	1920	4,700	144	2
Salt Lake City	Utah	Sept.–Oct.	1924	131,590	144	12
Fort Wayne	Indiana	Nov.–Dec.	1923	90,000	140	24
Grafton	West Virginia	Dec.	1927	10,000	125	20
Alpena	Michigan	Mar.–May	1920	11,101	118	11
Albany	New York	Apr.	1924	117,800	114	14
Franklin Boro	New Jersey	Nov.	1922	4,000	114	18
Covington, Newport	Kentucky	Feb.	1923	60,000	100	15
Seneca Falls	New York	Mar.–Sept.	1920	7,000	100	6
Mechanicville	New York	Jan.–Oct.	1920	8,900	96	10
"N"	Pennsylvania		1924	644	90	—
Gouverneur	New York	Sept.–Oct.	1921	4,140	85	4
Coalwood-Caretta	West Virginia		1929	400	85	6
Winston	Missouri	May	1929	339	82	3
Herington	Kansas	July–Aug.	1923	4,010	79	7
Assumption	Illinois	July	1927	1,852	78	—
					5,261	311

$$\%\text{ of all Typhoid} = \frac{5,261}{9,287} = 56.6 \qquad \%\text{ of all Deaths} = \frac{311}{614} = 50.6$$

10 LARGEST TYPHOID FEVER OUTBREAKS IN CANADA DURING DECADE 1920–1929 INCLUSIVE

Town	Province	Month	Year	Population	Cases	Deaths
Cochrane	Ontario	Spring	1923	3,500	935	70
Pt. Gatineau	Quebec	Aug.	1929	2,000	200	9
St. Leonards	New Brunswick		1927	1,200	200	
Terrebanne	Quebec	Mar.	1920	2,000	160	
St. Jerome	Quebec	Nov.	1923	8,000	115	4
Bathhurst	New Brunswick		1920	1,500	115	
Edmondston	New Brunswick		1923	5,000	100	
Lachine	Quebec	Feb.–Mar.	1924	15,000	88	11
Pottam Twp.	Quebec	Apr.	1923	350	87	9
Buckingham	Quebec	Jan.	1928	3,800	65	
					2,065	103

$$\%\text{ of all Typhoid} = \frac{2,065}{2,836} = 73.0 \qquad \%\text{ of all Deaths} = \frac{103}{145} = 71.0$$

United States and the 10 largest for Canada. It is interesting to note that 8 of the typhoid outbreaks in the United States and 3 of those in Canada had 200 cases or more each.

Each country had an epidemic of about 1,000 cases. That at Winona Lake, Ind., was due to a cross-connection with the water supply at a religious camp meeting place. The State Board of Health reports that practically all of the victims were out of town visitors, citizens in a large number of states being affected. The 1,000 reported cases probably do not include all which occurred, although the extent of this outbreak was thoroughly investigated.

The Cochrane, Ont., typhoid fever epidemic, with 935 cases and 70 deaths, was one of the most severe water-borne outbreaks in Canada's history. It was caused by sewage entering a lake from which the city water supply was obtained, owing to a change in water level of an adjacent lake into which the city discharged its sewage. Considering that the population of Cochrane was only 3,500, this is one of the most severe outbreaks on record.

The Salem, O., typhoid outbreak, as well as the one at Santa Ana,

TABLE VIII

25 LARGEST REPORTED DYSENTERY OUTBREAKS IN UNITED STATES DURING THE DECADE 1920–1929 INCLUSIVE IN ORDER OF MAGNITUDE

Town	State	Month	Year	Population	Cases
Detroit	Michigan	Feb.	1926	1,300,000	45,000
Santa Ana	California	Jan.–Feb.	1924	30,000	10,000
Salem	Ohio	Aug.–Jan.	1920–21	10,305	7,000
Fort Wayne	Indiana	Mar.	1929	100,000	5,000
Hillsboro	Ohio	Jan.	1921	4,356	2,000
Ozark Beach	Missouri	July	1928–29		2,000
Charlestown	Illinois	Nov.	1925	6,615	2,000
Greenville	Illinois	Jan.	1925	3,091	2,000
Riverside	Illinois	Sept.	1929	2,532	1,000
Bloomington	Illinois	Jan.	1920	28,725	1,000
Marseilles	Illinois	Jan.	1928	3,391	700
Garrett	Indiana	Nov.	1925	5,000	600
Oswego	New York	Dec.–Jan.	1928	22,369	500
Canton	Mississippi	Jan.	1922	3,000	500
"B"	Pennsylvania		1921	17,466	500
Yorkville	Illinois	Oct.	1928	411	400
Delaware	Ohio	Sept.–Dec.	1921	8,756	373
Covington Newport Packing Plant	Kentucky	Feb.	1923	60,000	300
So. St. Paul	Minnesota	June	1929	2,700	300
"A"	Tennessee	Jan.	1928	1,500	300
Grand Forks	North Dakota	Jan.	1928	14,010	300
Shirley	Indiana	Mar.	1927	1,200	250
No. Judson	Indiana	Sept.	1927	1,200	200
So. Pasadena	California	Apr.	1924	4,000	200
"A"	Pennsylvania		1922	1,943	200
Williamson	West Virginia	July	1924	7,000	111
					82,734

$$\% \text{ of all Dysentery} = \frac{82,734}{83,995} = 98.6$$

Calif., were bitter lessons in public health control. The former was caused by sewage entering a break in a gravity conduit; the latter by sewage backing up in a drain from an air lift well allowing pollution to enter the top of the well.

Ten dysentery outbreaks included 1,000 or more cases. It is believed that the reporting of dysentery cases in connection with other typhoid outbreaks is far from complete. No dysentery cases were reported in the Canada statistics.

In both the Salem and Santa Ana outbreaks there was a large number of dysentery cases as well as typhoid fever, 7,000 and 10,000 respectively. The Detroit outbreak leads the dysentery list with 45,000 to 50,000 cases.

REPEAT OUTBREAKS FROM SAME CAUSE

There were 5 repeat outbreaks from the same cause, indicating lack of proper corrective measures. These were:

City	State	Year	Typhoid Fever Cases	Typhoid Fever Deaths	Dysentery Cases	Cause
Talledega	Alabama	1921	25+	—	—	Improper chlorination control
"	"	1923	17	—	—	" " "
Fort Wayne	Indiana	1923	140	20	—	Cross-connection
" "	"	1929	53	3	500	" "
Herington	Kansas	1922	—	—	Many	Polluted spring
"	"	1923	19	7	?	" "
Grand Forks	N. Dakota	1928	—	—	1,500	Leak in suction line under river
" "	" "	1929	—	—	General	
Wausau	Wisconsin	1923	7	3	20	Cross-connection
"	"	1924	4	—	60	" "

REPEAT OUTBREAKS IN SAME CITY—DIFFERENT CAUSE

In 4 cities there were more than one outbreak during the decade; in fact at Sturgeon Bay, Wis., including the rural district outside the city, there were 4 distinct ones.

City	State	Year	Typhoid Fever Cases	Typhoid Fever Deaths	Dysentery Cases	Cause
Albany	New York	1924	114	14	?	Leaky gravity conduit under canal. 2nd—cross-connection
"	" "	1928	30	1	8	
Oswego	" "	1927	10	2	—	Cross-connection
"	" "	1927	—	—	500	Inadequate chlorination
Sturgeon Bay	Wisconsin	1921	21	1	—	Surface pollution of shallow well in creviced limestone by sewers and privies
" "	"	1922	31	3	—	
" "	"	1924	20	2	—	
" "	"	1929	70	7	—	
Fond du Lac	"	1922	12	—	—	Leakage of sewage into exhaust from air lift well
" " "	"	1929	50	3	—	Pollution of well supply through river draining into abandoned well

DAMAGE SUITS RESULTING FROM WATER-BORNE OUTBREAKS

During the decade 1920–1929 considerable history was made in the courts both in the United States and Canada as to the responsibility of cities, private water companies and industries in regard to illness resulting from pollution of public water supplies. The trend of the courts is distinctly toward awarding substantial damages against those cities and companies subjecting the public to health hazards through carelessness. Among the more important suits were those at:

United States	Canada
Olean, New York	Owen Sound, Ontario
Albany, New York	Jordan, Ontario
Ogden, Utah	Kingsville, Ontario
Everett, Washington	
Fort Wayne, Indiana	
City "A," Texas	

CONCLUSIONS

1. While the typhoid fever death rate in the United States and Canada has made a phenomenal drop since 1900, many large water-borne typhoid outbreaks have occurred during the last decade.

2. Special attention is needed for better control over the safety of water supplies in small cities, as 64.9 per cent of the outbreaks in the United States and 77.5 per cent of those in Canada occurred in those of 5,000 population and under.

3. A study of the causes of 282 outbreaks shows clearly the need for more attention on the part of water works and health officials to supervision and control over treatment processes, especially over disinfection where pollutional loads on treatment plants are high or where chlorination is the only safeguard.

4. Over three-quarters of the water-borne illness reported in the United States during the decade 1920–1929, representing 40 per cent of the outbreaks, was due primarily not to pollution of the raw water at its source, but to defects in the system for collecting, treating, storing or distributing of the water for public consumption.

5. Unprotected cross-connections between polluted fire supplies and public water systems were the most important single cause contributing to water-borne outbreaks during the decade 1920–1929 and demand the most active attention of health and water works officials.

6. During the decade there were 5 repeat water-borne outbreaks in 1 city from the same cause, and repeat outbreaks in 4 from different causes.

7. The courts in both the United States and Canada are increasingly holding cities and water companies liable for heavy financial damages for illness resulting from pollution of public supplies.

Epidemiological Study of 383 Cases of Meningococcus Meningitis in the City of Milwaukee, 1927-1928 and 1929*

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Director, Bureau of Communicable Disease, Health Department, Milwaukee, Wis.

SOME communicable diseases such as smallpox, diphtheria, and typhoid fever can now be definitely prevented or controlled through the use of our present-day knowledge of medical science. Other communicable diseases, however, particularly meningococcus meningitis, appear now and then to take their toll of human lives. The methods of prevention or control have very little influence on the progress of this disease.

Meningococcus meningitis began to show an increase above its normal expectancy in Milwaukee, an industrial city of 575,000 population, in December, 1926. During the following 3 years, 1927, 1928 and 1929, it was prevalent in the city, and 383 definitely confirmed cases, with 208 deaths, occurred during this time.

There were 2 large epidemic waves. The first started in December, 1926, and reached its peak in April, 1927, fell to a fairly low point in August, but was still above its expectancy. The disease again increased somewhat in October and November, fell in December, and showed a small rise in March and April of 1928, then fell for the first time below its normal expectancy in August. The second began in October, 1928, reached its peak in March, 1929, and then during the following months dropped until September when it fell below its expectancy. In November and December it rose slightly, but in January, 1930, the disease fell below its norm, and during the past 9 months of 1930 has continued low. The wave of 1927 and 1928, with the smaller waves, continued for 19 months; and the second starting in October, 1928, continued for 12 months. There was a very definite seasonal incidence of these waves, which reached their peaks in the early spring months, March and April.

* Read before a Special Session on Meningitis of the Laboratory, Health Officers, and Epidemiology Sections of the American Public Health Association at the Fifty-ninth Annual Meeting at Fort Worth, Tex., October 27, 1930.

The cases of meningococcus meningitis, although somewhat scattered, were more prevalent in certain parts of the city. One area in the center of the city just west of the Milwaukee River, in a radius of 45 square blocks, had over 58 cases. This area contains a mixed population, and is commonly called "The League of All Nations," because there are at least 20 different races and nationalities in that locality. It is also a very congested and very poor district. East of this area, across the river, there was another group of cases composed largely of Italians. In the lower part of the city was the third group, made up very largely of the Polish. Forty-three of the cases were persons living in neighboring communities, who were brought to local hospitals for treatment.

The ages of the persons with meningococcus meningitis ranged from a few days to 60 years. The largest number of cases was in the preschool age group, 1 to 5 years, followed closely by the school groups, 6 to 10, and 11 to 15. These groups were followed by babies under 1 year, and next were the adults, with a decrease in cases as the age increased (Figure II).

Almost twice as many males had meningococcus meningitis as females. There were 235 males compared to 148 females. This larger proportion of males to females was evident in all of the age

FIGURE I

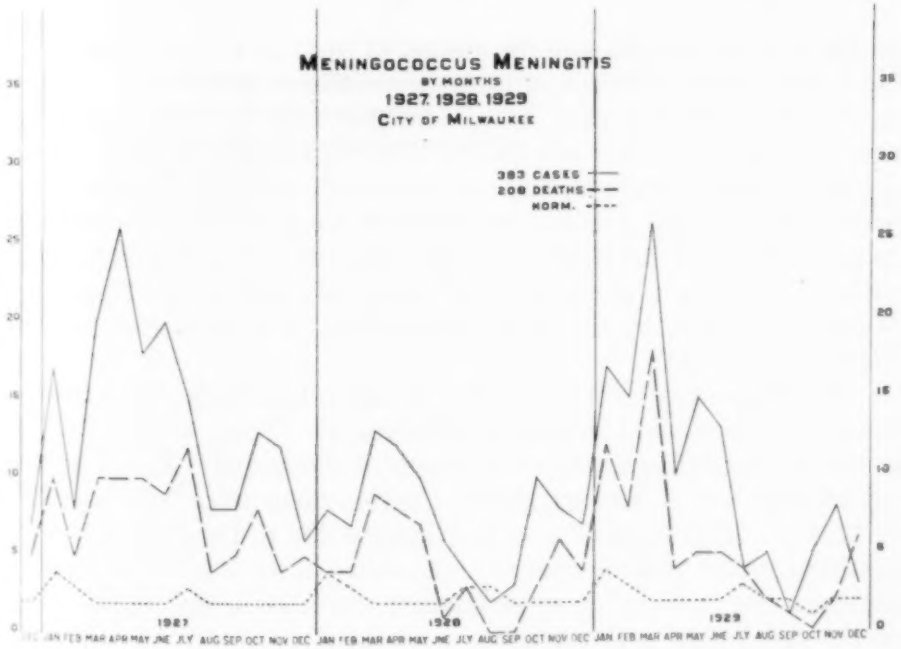

MENINGOCOCCUS MENINGITIS
BY MONTHS
1927, 1928, 1929
CITY OF MILWAUKEE
383 CASES
209 DEATHS
NORM.
1927
1928
1929
JAN FEB MAR APR MAY JNE JLY AUG SEP OCT NOV DEC JAN FEB MAR APR MAY JNE JLY AUG SEP OCT NOV DEC JAN FEB MAR APR MAY JNE JLY AUG SEP OCT NOV DEC

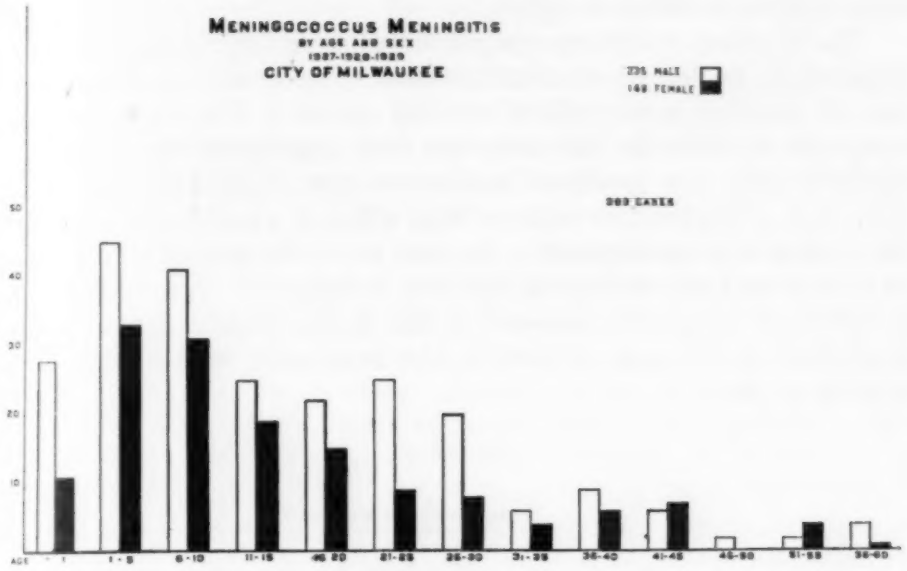
FIGURE II

groups with the exception of the groups 41 to 45 and 51 to 55, in which the females were in the larger proportion (Figure III).

Eighteen different races or nationalities and one unknown group were represented in the 383 cases. The nationality of these groups portrays country of origin, and not necessarily country of birth. The American group was a mixed one in which the parentage was made up of many different nationalities. The American, Polish and German nationalities lead in the number of cases, followed by the Negro and Jewish races, then by the other nationalities of Europe, Ireland, and Mexico (Figure IV).

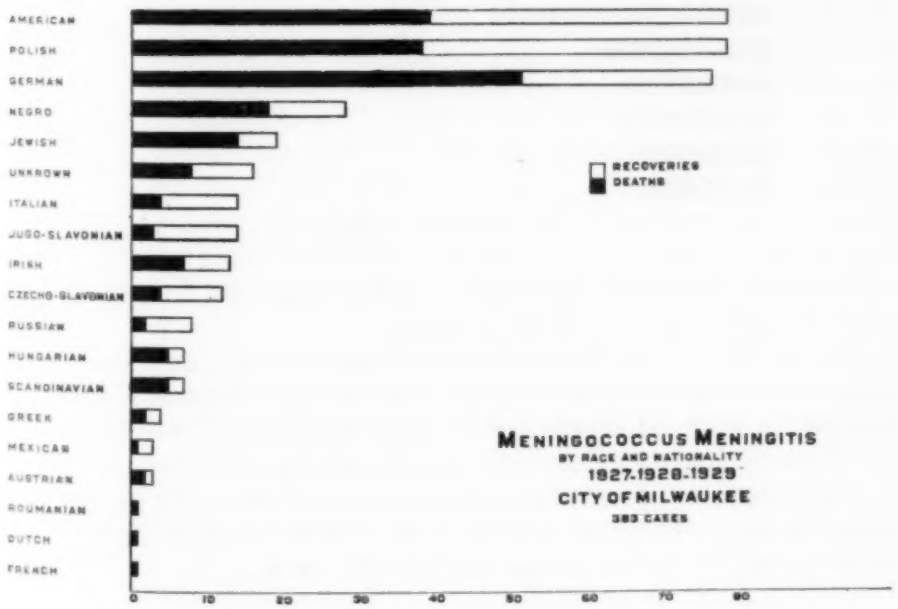
The Negro race, 4th in number of cases, has during the past few years shown a marked increase in Milwaukee. There were only 2,000 in the city according to the 1920 census, while in 1927, according to a report from the Milwaukee Urban League, there were between 8,000 to 10,000. This increase was very largely due to the influx from the southern states; and the Negro race coming from a mild climate to a northern one, and living in unfamiliar conditions, was found to be rather susceptible to this disease.

FIGURE III



The schools played no part in the spread of meningococcus meningitis, although a number of cases were among school children. One case was found in each of 52 schools; 2 cases each in 10; 3 cases each in 7; 4 cases each in 2; while in 1 there were 5 cases. However, there was no relationship between these cases for they developed at different

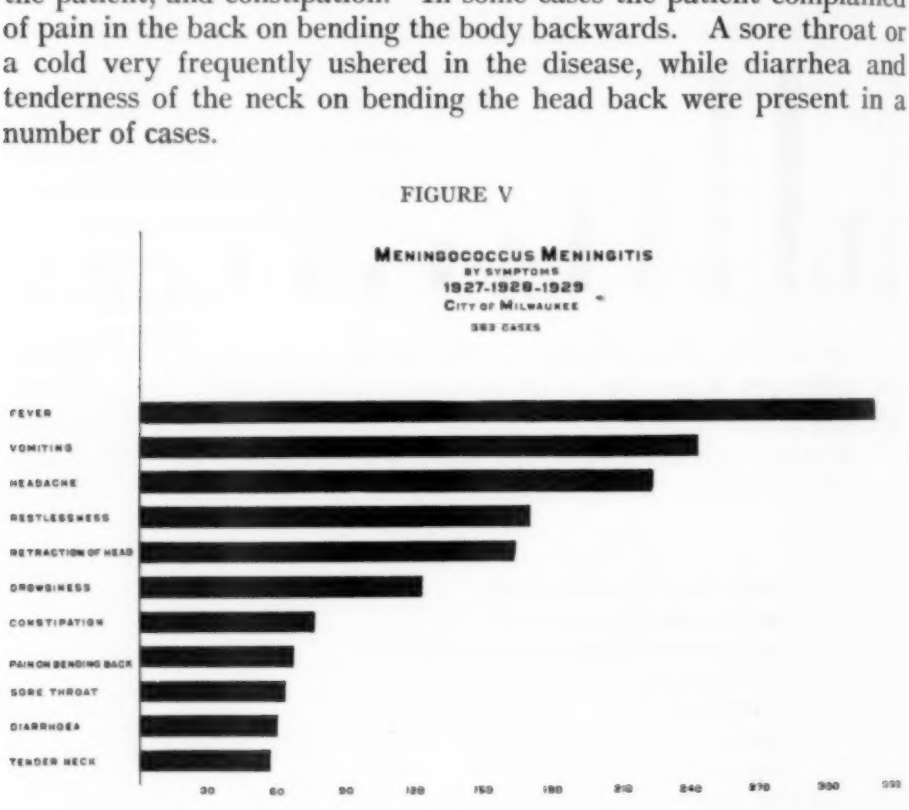
FIGURE IV



times and there was no association or contact between them, as they were children in different classes.

The common symptoms complained of were largely those usually found at the beginning of a communicable disease, with some localization of infection in the central nervous system. The most common symptoms found in the 383 cases were fever accompanied by vomiting, headache of a very persistent and severe type, restlessness and some retraction of the head, drowsiness from which it was difficult to arouse the patient, and constipation. In some cases the patient complained of pain in the back on bending the body backwards. A sore throat or a cold very frequently ushered in the disease, while diarrhea and tenderness of the neck on bending the head back were present in a number of cases.

FIGURE V



Meningococcus meningitis had a rather high fatality, which was about the same for each of the 3 years.

In 1927 there were 92 deaths and 79 recoveries, a case fatality of 53 per cent; in 1928, 49 deaths and 41 recoveries, a case fatality of 53 per cent; in 1929, 67 deaths and 55 recoveries, a total for the 3 years of 208 deaths and 175 recoveries, a case fatality of 54 per cent.

The case fatality varied somewhat in the different age groups, the highest being in the age groups 41 to 45, and 46 to 50, in which all of the 15 cases died, a case fatality of 100 per cent.

Next came the babies under 1 year, with a case fatality of 84 per cent; followed very closely by the groups 51 to 55, and 56 to 60, in which the case fatality was over 80 per cent.

The groups with a case fatality of 60 per cent and over were adults 26 to 30, 31 to 35, 36 to 40; followed by the age group 16 to 20, with a case fatality of 57 per cent; and next those of preschool age 1 to 5 with a case fatality of 40 per cent. The group with the lowest case fatality, 36 per cent, was that of 11 to 15 years of age.

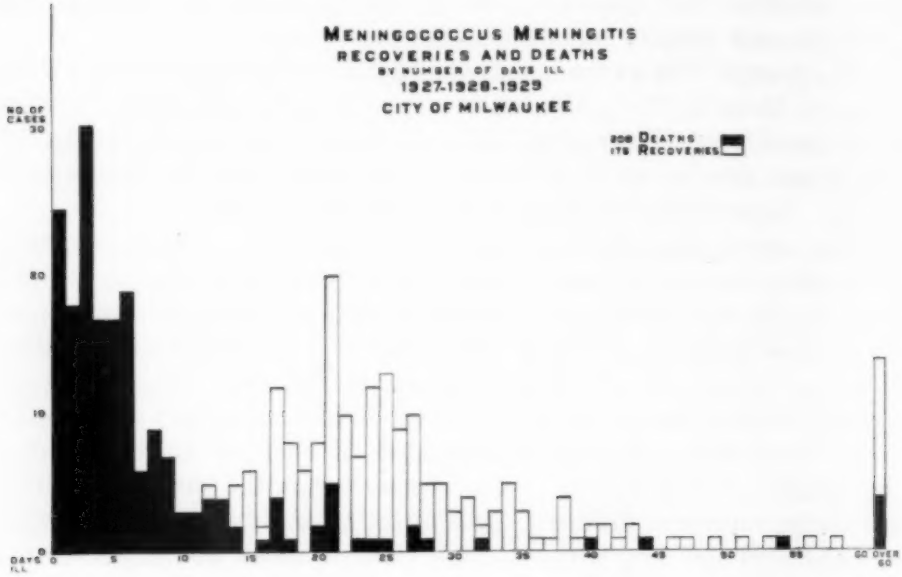
The largest proportion of cases were treated in local hospitals, only a few being treated at home. One hundred and sixty-one cases were cared for in the Municipal Contagious Disease Hospital, known as South View Isolation, where 61 died and 100 recovered, a case fatality of 37 per cent. In 10 other hospitals in the city 152 cases were treated, 95 died and 62 recovered, a case fatality of 62 per cent; while in the homes where 70 cases were treated, 52 died and 18 recovered, a case fatality of 74 per cent. All of these cases in the various hospitals and homes represent different types of infection, from those who were overwhelmed and died within a short time, to those who had some resistance and fought the disease for a certain length of time without serum treatment. The Municipal South View Isolation Hospital, which had the lowest case fatality rate, used routinely the cisternal puncture in treatment with the other methods, and found it to be safe and efficient.

The first few days of illness were the ones of greatest danger for the life of the patients, for 60 per cent of all deaths occurred during the first 6 days of illness. The largest number of deaths occurred on the 3d day, followed closely by the 1st, 6th, 2d, 4th and 5th days. Deaths continued to occur, however, during the following days, decreasing as the number of days of illness increased.

No recoveries were reported until the 12th day of illness, and from that time on through the 35th day over 77 per cent of all recoveries had taken place. The largest number of recoveries were from the 21st to the 26th days of illness. However, recoveries continued to be reported for as long as 60 days and over from date of onset (Figure VI).

A large number of adults and children were exposed, but did not develop it. Eight hundred and forty adults and 690 children contacts, under 17 years of age, were closely associated with persons who had meningococcus meningitis, and showed no symptoms of this disease. Three hundred and forty-six persons developed meningococcus meningitis and no further cases occurred among the immediate contacts or associates in the family; while in 17 different families there were 2 or more cases in each, or a total of 37 multiple cases.

FIGURE VI



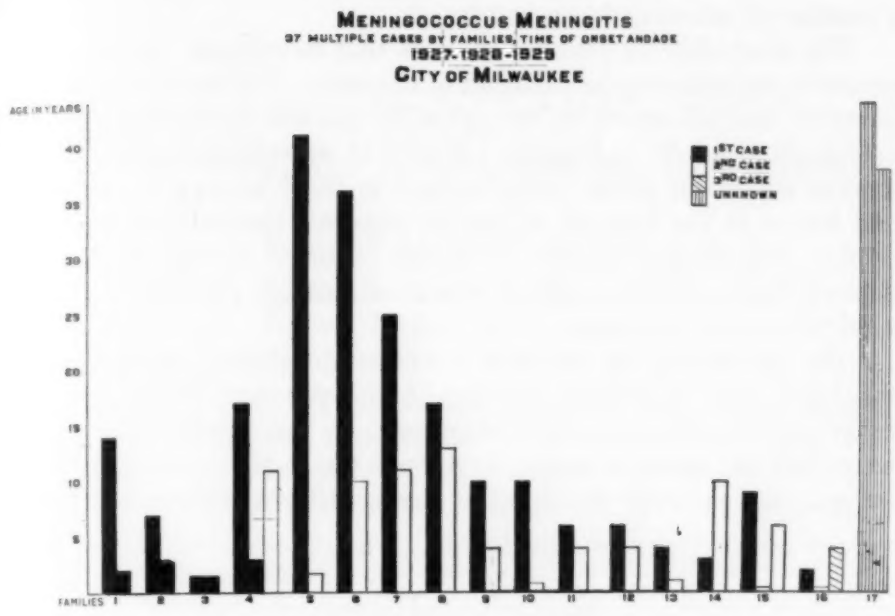
In 3 of these families, Nos. 4, 15, and 16, where multiple cases occurred, there were 3 cases each, while in the other 14 there were only 2 cases. In all of the homes with the exception of the first 3 there was an interval of a few days between the onset of the first case and the others. In the first 3 the dates of onset of the 1st and 2d cases were the same.

Information concerning family No. 17 is somewhat uncertain because both cases, a husband and wife, were taken out of a burning building in a semi-conscious condition to the Emergency Hospital where it was found that they had meningococcus meningitis, and they died before complete information could be obtained.

As a rule the older persons in the family developed the disease first, with the exception of families Nos. 14, 16, and 17 (unknown). This was especially noticeable in family No. 5 where the mother, the 1st case, developed the disease 3 days before her 19 months old baby came down. Also, in family No. 6 where the father, 36 years old, developed the disease 7 days before his 10 year old son, both slept together just prior to the onset of their illness. In family No. 7 the 25 year old uncle developed the disease 3 days before his 10 year old niece.

The interval between the onset of these multiple cases in the homes varied from the same day to 8½ months. Eight multiple cases developed the disease on the same day in their respective families, indicating a common source of infection in the home; 20 developed within

FIGURE VII



1 to 8 days; 3 developed within 2½ months; 2 cases in 8½ months; and the interval for 2 was unknown.

All of the contacts with cases of meningococcus meningitis had postnasal cultures taken to detect possible carriers. The percentage of carriers found varied from an average per month of less than 1 to as high as 30 positive.

All carriers were isolated until two consecutive negative cultures were obtained, and as a rule they cleared up rather quickly; 12 days being the longest time that any was held. The culturing and isolation of these carriers seemed to have little or no influence in preventing the spread of this disease.

SUMMARY

Meningococcus meningitis was prevalent in the City of Milwaukee for 3 years, with 383 cases, resulting in 208 deaths. The cases, although scattered, were more prevalent in certain congested parts of the city, and there was a high seasonal incidence in the early spring months of March and April. The ages varied from less than 1 year to 60 years, the highest proportion being in the preschool age group under 5 years, and there was a larger proportion of males than females. The American, German and Polish nationalities lead all others in number of cases.

The schools played no part in the spread of this disease, although a number of school children had it.

The morbidity, or number of cases that developed, was not influenced by the culturing or isolation of carriers. The case fatality rate, however, was influenced by the age of the patient, being highest in the age group 41 to 50, and under 1 year. It was also influenced by the kind of treatment given, being highest in those treated in the homes and lowest in the hospital where the cisternal method was used routinely. The largest number of deaths occurred during the first few days of illness, and the patients who lived through the first 6 days had a fair chance of recovery.

The possibility of intimate contacts developing meningococcus meningitis was very slight, for less than 1 per cent of those exposed developed the disease. The older ones in the family, where there were multiple cases, as a rule, developed the infection first, and in no instance did an adult develop the disease after a child in the family.

Exit the Milkmaid

"Where are you going, my pretty maid?"
"To look at the merry-go-round," she said.
"Will you ride on it with me, my pretty maid?"
"Oh, no, sir; it's just for the cows," she said.

In some such fashion the old nursery rhyme must be remodeled to celebrate the machine's latest triumph—elimination from the scene of the milkmaid, with her wooden pail, three-legged stool and fly swatter. The new rotolactor, as installed at a dairy near Plainsboro, N. J., seems certain to make that romantic rural creature a constant reader of the "Help Wanted" columns. The device is nothing more than a slow-motion merry-go-round, without music, on which the cows, 50 of them, ride while a milking machine does the milkmaid's former duty.

First, however, Bossy gets a bath from a hose; then she is dried by hot air, and finally she is milked while riding gracefully around the barn, with another cow waiting to take her place when the circuit is completed. True, the milking is done under more hygienic auspices, and in less time than it would take the milkmaid to remove Bossy's tail from the bucket. But the passing of a picturesque calling is to be lamented, particularly when other feminine fields are overcrowded with too many permanent wavers, Hollywood aspirants and woman stunt flyers.—*St. Louis Post-Dispatch*, Jan. 21, 1931.

An Epidemic of Cerebrospinal Meningitis in Saginaw, Mich.*

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(Formerly, Health Officer of Saginaw)

SAGINAW is a city of approximately 85,000 population, composed of white, brown, and black races. It was a great lumbering center in its earliest days, but during the past decade has developed into an industrial and agricultural center. On account of its extensive industrial development, laborers have moved into the city from all parts of the United States, Canada, and Mexico.

The first knowledge that the local Health Department had of the presence of meningitis in Saginaw was on February 13, 1929, when it was accidentally learned that there were 5 cases in one hospital and 2 in another. This number of any type of meningitis cases demands an immediate investigation, which was made, and the 7 cases were promptly segregated in the two public hospitals. All close contacts were cultured for possible carriers.

Owing to the seriousness of this disease, the extreme restlessness of the patients, and the difficult treatment necessary, it was determined to hospitalize all cases if possible. Saginaw did not have a contagious disease hospital when the epidemic began and only after a humanitarian plea was made at a joint meeting of the boards of the two institutions mentioned was it possible to obtain adequate hospitalization for the cases which subsequently developed.

All culturing of cases was done by the local laboratory. This policy was adopted for three reasons: (1) it would cost less than the employment of additional personnel who would be compelled to have special laboratory training; (2) the meningococcus does not live at room temperature long enough to get to the laboratory with swabs, without incubation at body temperature; (3) the swabs are best taken by a person having a thorough knowledge of the peculiarities and characteristics of these germs, especially as to their habitat in nature or

* Read before a Special Session of the Laboratory, Epidemiology, and Health Officers Section of the American Public Health Association at the Fifty-ninth Annual Meeting at Fort Worth, Tex., October 27, 1930.

location in the posterior wall of the nasopharynx, and an understanding of the measures employed to guard against contamination of the swab by saliva.

A large epidemiological chart of all cases was kept in the Health Department office, on which the following information was recorded: name of patient, number of case, hospital or home case, death or recovery, exposure to healthy carriers, residence address, milk supply, color, age, sex, type and place of occupation, types and places of occupation of other members of the family, school and grade, date reported, attendance at dances, churches, theaters, Sunday schools, bathing pools, parties or other public or private gatherings, during 14 days prior to illness. With this chart before him, the health officer was enabled to detect a common factor in any 2 or more cases and be guided in his actions.

MANAGEMENT OF CASES

Cases or suspected cases were hospitalized promptly. Since the treatment is heroic and difficult to administer in the home, hospitalization was insisted upon. This enabled the physicians to render maximum treatment with minimum danger to the patient. No patient was released from the hospital or home until 2 successive negative cultures taken from swabs of the nasopharynx, 24 hours apart, were reported by the laboratory, and not until after the 14th day from the onset of the disease under any circumstances.

All cases except 11 were hospitalized, and of these 11 who refused hospitalization 7 died. These families were rigidly quarantined for a minimum of 14 days except the breadwinners, who were released after the first negative swab and allowed to reside elsewhere so as to carry on their occupations.

Thorough cleaning, disinfection, exposure to fresh air, and sunlight were required for all homes when cases were removed or after recovery.

The field investigations of the cases failed to show contact between known cases or a common source of infection. Moreover, since no relationship was established as to sex, color, age, milk supply, occupation, residence, habits, etc., it was postulated that the disease was spread by healthy carriers.

MANAGEMENT OF CONTACTS

The indiscriminate culturing of groups of casual or transient contacts was not done except when as many as 2 cases occurred among a small group, and then only after the group survey indicated the necessity. At no time during the epidemic did secondary cases occur out-

side of a few large families where the homes were small and the living conditions crowded and intimate.

Contacts were taken by their own private conveyances or carried at county expense to the laboratory for culturing, and then returned home to remain in quarantine until negative reports were received for each of the 2 separate 24-hour cultures. If the reports showed that there were no carriers found among any of the close contacts, all bread-winners were promptly released, but all school children or other members of the families were kept at home for 7 days irrespective of the negative laboratory reports. If a carrier was found among the contacts, he was placed under placarded isolation in a room alone, with separate eating, drinking, toilet and sleeping facilities until 2 successive negative cultures were obtained by the laboratory after the 7th day. No carriers were kept in isolation longer than 14 days, and those showing a positive culture were carefully instructed upon release.

GENERAL DATA

This epidemic resulted in 264 cases and 85 deaths. The cost to the county for proper care of these cases and contacts was $60,000. This sum is indicative of the fact that a majority of the cases were among families of the lower economic group.

A very small minority of the population, including 1 physician and

FIGURE I

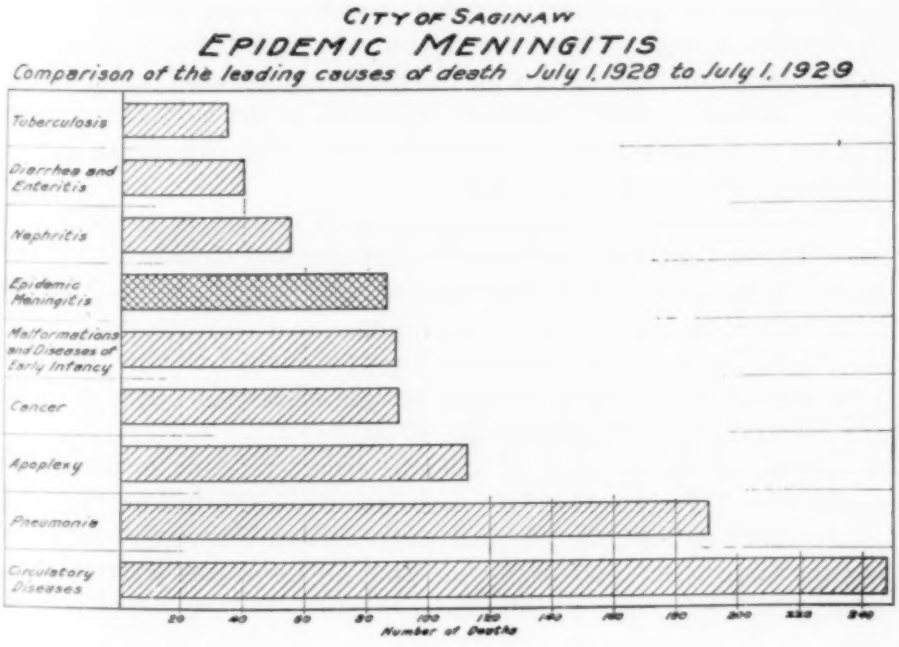
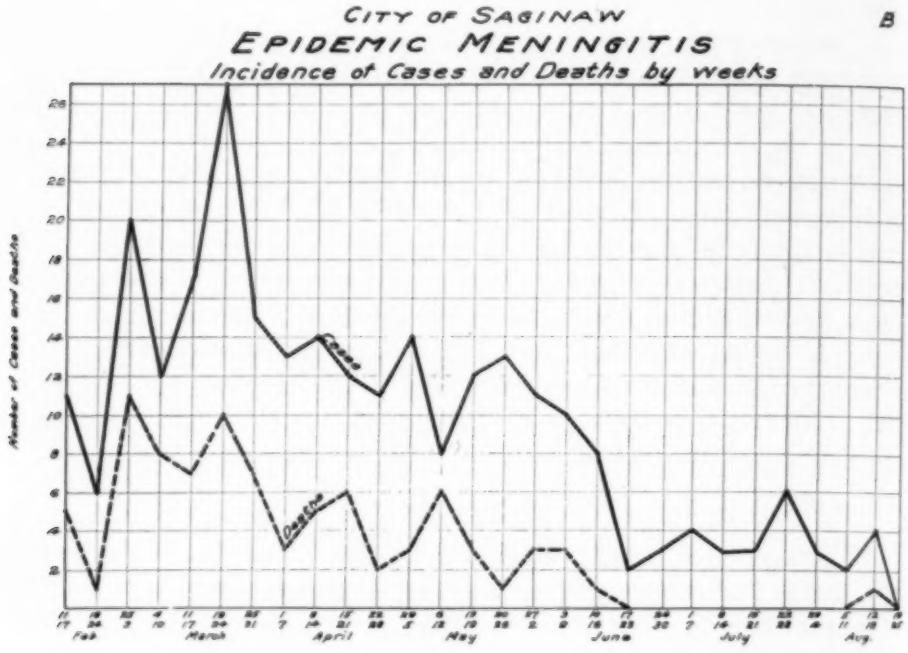


FIGURE II



1 dentist, during the first few weeks listened with over-anxious ears to greatly exaggerated reports and caused the Health Department no small amount of unnecessary trouble as well as extra work in proving the rumors untrue. These few hysterical persons did not seek first hand information, and except for the medical profession and the newspapers, who were kept truthfully informed, might have caused more damage to business, school attendance, etc., than even a much more serious epidemic could have done.

The State Health Department was asked to send a consultant on 3 or 4 different occasions, and on each visit the local Health Department as well as the public was advised that all was being done that could be done to produce the best possible results.

Figure I shows how prominent a part epidemic meningitis played as a cause of death among the nine leading diseases in Saginaw during the year July 1, 1928, to June 30, 1929.

Figure II shows cases and deaths from epidemic meningitis by weeks from February 11, 1929, to August 27, 1929, inclusive.

It will be noticed that the peak of the epidemic appeared early during the sixth week, and from that time on there was a more or less steady decline in cases and deaths.

DISTRIBUTION OF CASES

Geographical—Every ward had at least 2 cases and in the 1st and 21st the cases greatly outnumbered those in any others. In these two wards, the population is composed of a mixture of white, colored and Mexican families and there is much crowding as well as poor sanitation. It is not possible to learn the population by wards at this time, so a word picture instead of actual figures must be used. There is a very large industry located in the midst of the 1st and the 21st wards, which during the 18 months preceding the epidemic doubled its capacity, and as a result many laborers came from all parts of the United States and Mexico, many of them locating as near the plant as possible in houses which were already full. Since there were no vacant houses, there was, and is yet, only a partial relief to the crowded condition in these homes.

Racial—Figure III shows cases and deaths distributed according to color.

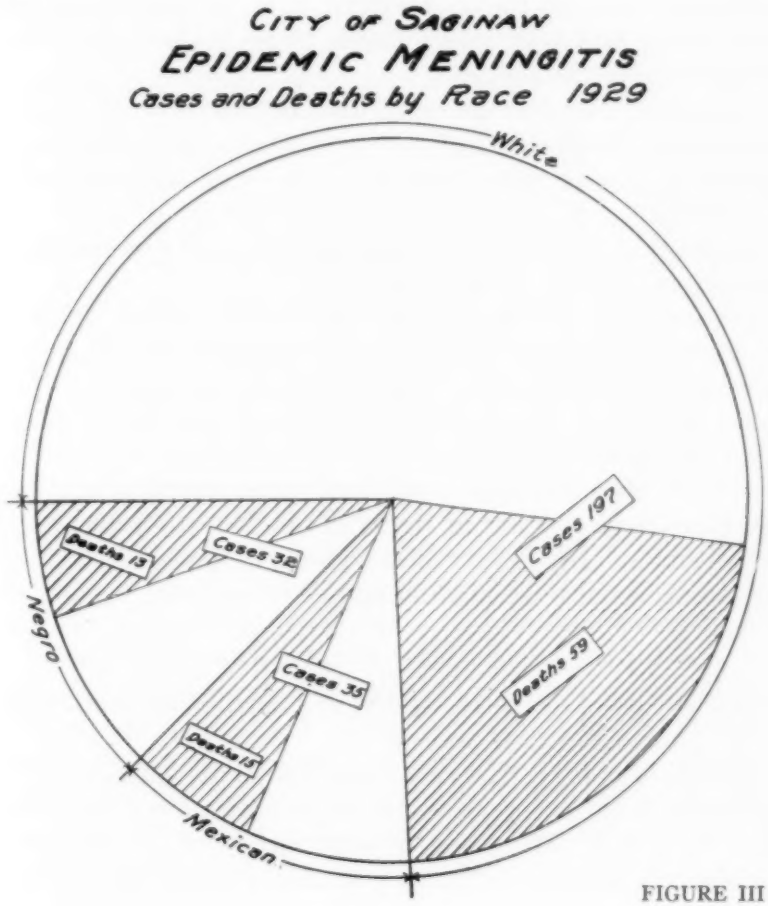


FIGURE III

CASES AND DEATHS BY RACE

White	cases	number	197	Deaths	59	Fatality	per	cent	30
Negro	"	"	32	"	13	"	"	"	40
Mexican	"	"	35	"	15	"	"	"	43

The proportion of Negroes and Mexicans in the general population of Saginaw is not known, but on the basis of their estimated proportion the number of cases of meningitis was higher among these two groups than among the white population.

The colored and Mexican patients received the same quantity and quality of hospital and professional treatment as did the white; consequently, less resistance to the disease is suspected as being the factor responsible for the higher fatality. Change of climate, crowded and unhygienic general living conditions and poor personal hygiene were no doubt important contributing factors.

It may be of interest to note that of the 32 Negro cases 26 came from rooming houses and that only 11 carriers were found among the close contacts. Among the 35 Mexican cases, 29 came from rooming houses or homes with more than 1 family living in them and 16 carriers were found among the contacts.

Occupational—The occupational distribution shows that among 66 industrial cases 14 different callings were represented, with the greatest number of cases coming from the very large industry located in wards 1 and 21.

Housewives developed the disease and in each instance the home work had been done by the patient.

School—Among 61 cases occurring among school children, 31 schools were represented, and only in 2 instances did as many as 2 cases occur in 1 schoolroom. The children in the 2 rooms were cultured and no carriers found, but adult carriers were found at home in 1 of the 2 instances.

Source of Milk Supply—The distribution of cases according to milk supplies is interesting in that for the 264 cases there were 26 separate sources. Like every other group of possible sources, milk was ruled out, leaving the healthy carrier as the only possible source.

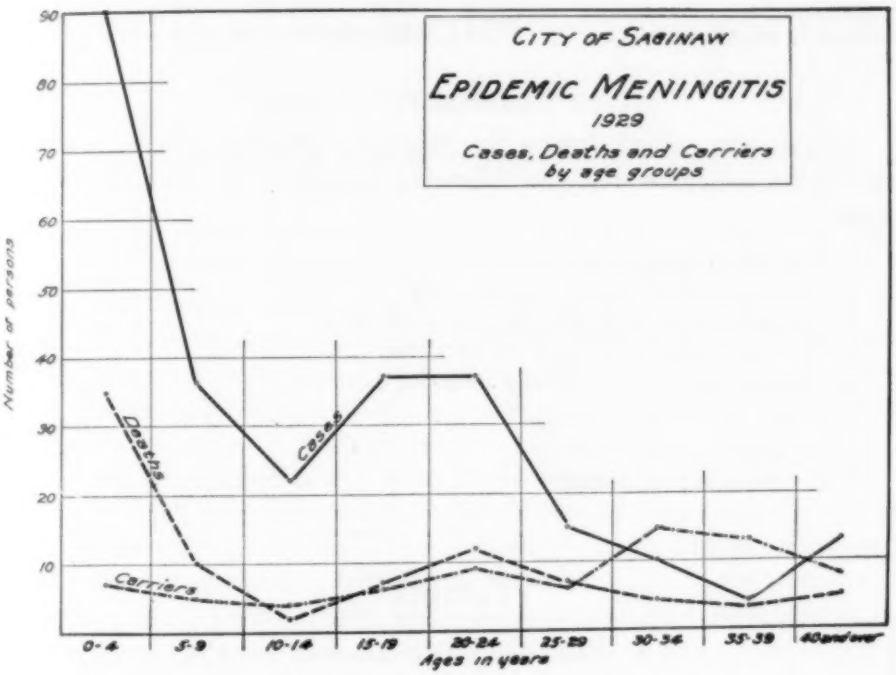
AGE GROUPS OF CASES, DEATHS AND CARRIERS

Figure IV shows the cases, deaths and carriers distributed according to age groups in 5 year periods.

It is at once noticed that cases and deaths are highest among the young—from birth to 4 years—and are lowest among the school age groups. It is more interesting to note the excess of carriers found among adults over those in the very young or school age groups.

There were approximately 500 cultures taken among the close contacts of which 73, or 14 per cent, were positive. None of the 73 carriers had any symptoms of the disease. About 4 per cent remained carriers after the 14th day; all others gave 2 negative cultures by the 10th day.

FIGURE IV



SECONDARY CASES AND RECOVERED CASES

In 2 instances, there were 3 cases in a family, and in 9, 2 cases in a family. All other cases came from homes or boarding houses where only 1 case per house developed.

Following is a summary of defects, classified more or less according to parts of the bodies affected, determined by a survey of physical conditions among recovered cases, 2 to 7 months following discharge from quarantine.

Many of these so-called recovered cases have several of the above conditions. In 2 instances, after the patients had made apparently complete clinical recoveries, they suffered relapses. Symptoms appeared exactly like those of the first attack 2 months previously. No meningococci were isolated during the second attack from either the spinal fluid or the throats.

SUMMARY OF DEFECTS 2 TO 7 MONTHS AFTER DISCHARGE

Well and in good health	66	Motion of arms affected	4
Defective hearing	24	Markedly underweight	3
Defective vision	18	Defective speech	3
Very nervous	15	Stiffness in muscles of neck	2
Tire easily and on part time work	13	Enlargement of joints	2
Pain in back	12	Persistent sore spot on spine	1
Stiffness in lower limbs	11	Nephritis	1
Instability of mind	6	Scoliosis	1
Severe headaches	4		
Returned to hospital second time	4	Under physician's care when visited	27

SUMMARY

Experience gained during the Saginaw epidemic of cerebrospinal meningitis indicates that the following measures are of great importance:

1. Immediate hospitalization of cases
2. Immediate use of serum for cases only
3. Quarantine and multiple culturing of all cases
4. Multiple culturing of close contacts only
5. Keeping the public truthfully informed as to the
   a. progress of the epidemic
   b. nature of the disease
   c. precautions necessary

Futility

HE brushed his teeth twice a day with a nationally advertised toothpaste, reports Louis L. Morris, editor of the Hartwell, Ga., *Sun*. The doctor examined him twice a year. He wore his rubbers when it rained. He slept with the windows open. He stuck to a diet with plenty of fresh vegetables. He relinquished his tonsils and traded in several worn out glands. He golfed, but never more than 18 holes at a time. He got at least 8 hours sleep every night. He never smoked, drank or lost his temper. He did his daily dozen daily. He was all set to live to be a hundred.

The funeral will be held next Wednesday. He is survived by 18 specialists, 4 health institutes, 6 gymnasiums and numerous manufacturers of health foods and antiseptics.

He had forgotten about trains at the grade crossings.—*Western Hospital Review*, Jan., 1931.

Experience of the Meningitis Division of the New York Department of Health*

JOSEPHINE B. NEAL, M. D.

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THE Meningitis Division of the Department of Health of New York City was established by William H. Park, M.D., in 1910. Its original purpose was to provide a staff of physicians trained in the diagnosis and treatment of meningococcus meningitis. The services of this staff are available to the physicians of New York City and cases are seen only in consultation. The establishment of this division was advisable because the successful diagnosis and treatment of meningococcus meningitis calls for no small degree of experience.

No general rules in regard to the administration of serum can be followed routinely; each case must be treated individually. Cases are seen only in consultation with the family physician, as we wish to cooperate, not to compete, with the general practitioner, and also as the family is better satisfied if its own physician is present.

As time has passed, the scope of the work has expanded to include other forms of meningitis, infantile paralysis, epidemic encephalitis and other acute diseases of the central nervous system. We also see many patients suffering from various diseases in which meningeal symptoms are present without a real infection of the central nervous system.

Laboratory facilities are provided for the examination not only of the spinal fluids of our own cases but also of those sent to us by physicians who are taking care of their patients without our coöperation.

The physicians of the staff of the Meningitis Division are available at any time. Meningitis, poliomyelitis and epidemic encephalitis are reportable to the Health Department. The reports are forwarded to our office. The physicians in charge of the cases are called by us to learn if consultation is desired. At present many physicians call us

* Read before a Special Session of the Laboratory, Epidemiology, and Health Officers Sections of the American Public Health Association at the Fifty-ninth Annual Meeting at Fort Worth, Tex., October 27, 1930.

directly. One might think that our work has a very limited field. As a fact, the scope of diseases to be diagnosed is a large one. A partial list of diagnoses made during the last 3 years includes the following diseases in addition to the various forms of meningitis, poliomyelitis and epidemic encephalitis: acute miliary tuberculosis, arsenical poisoning, anthrax, alcoholic neuritis, pernicious anemia, brain tumor, brain abscess, brachial palsy with cerebral hemorrhage, concussion of the brain, cerebral congestion with pertussis, chronic inflammatory arthritis, cerebral hemorrhage, cerebral embolism, chorea, cerebrospinal syphilis, dislocated atlas, diabetes, dementia praecox, endocrine imbalance, epilepsy, erysipelas, erythema nodosum, sarcoma of the spine, exacerbation of a chronic nephritis, early diphtheritic paralysis, fibrinous pleurisy, follicular tonsillitis, fracture of the skull, glandular fever, hemorrhage of the spinal cord, hydrocephalus, hysteria, influenza, intraventricular hemorrhage, lead poisoning, Landry's paralysis, meningism with pneumonia, scarlet fever, enteritis, acidosis, otitis media, food allergy, malnutrition, typhoid fever and colitis; meningitis sympathica or serous meningitis with sinusitis, meningeal hemorrhage with bacterial endocarditis, multiple sclerosis, mastoiditis, myelitis, multiple neuritis, Mongolian idiocy, neurosis, neurasthenia, osteomyelitis, pyelitis, phlebitis, progressive muscular atrophy, paralysis following antirabic treatment, parotitis, post-diphtheritic paralysis, post-influenzal asthenia, rheumatism and pericarditis with embolism, retropharyngeal abscess, rickets, Schilder's disease, spontaneous meningeal hemorrhage, subacute spondylitis, status epilepticus, scurvy, spina bifida, sinus thrombosis, septicemia, typhus fever, tuberculous adenitis, trigeminal neuralgia, transverse myelitis, toxemia of pregnancy, trichinosis, tetany, varicella, whooping cough, methyl alcohol poisoning, encephalitis associated with scarlet fever, pneumonia, bronchial pneumonia, measles and vaccination.

Many of our cases and groups of cases present interesting problems but it will be necessary to limit this discussion almost exclusively to meningococcus meningitis.

Meningococcus meningitis may be divided as follows:

1. Acute forms—
   (a) Ordinary acute forms of greatly varying degrees of severity, in which the patient is well on the road to recovery or is dead within 10 days to 2 weeks
   (b) Fulminating, in which death occurs within 72 hours
   (c) Septicemic type, in which the septicemia is a more striking feature than the meningitis

2. Chronic forms—

(a) Ordinary chronic form in which the disease lasts 3 weeks or more before there is a decisive change for the better or worse

(b) Relapsing form

(c) Form in which the process becomes walled off either in the ventricles producing a basilar meningitis, or in pockets forming the encysted or loculated meningitis

The clinical course of the disease depends to no small degree upon the age of the patient. It is especially severe in infants and in adults over 30.

The space allotted to this paper does not permit a discussion of the symptomatology of all these forms of meningitis. In the ordinary acute form of meningitis, which is the most common, the onset is sudden with headache, vomiting, fever and sometimes chills. Within 24 to 36 hours stiffness of the neck and a positive Kernig and Brudzinski usually develop. A Babinski may or may not be present. A hemorrhagic rash is found in a varying percentage of cases. This usually appears very early in the disease. Petechiae are most common but the rash may appear as macular or purpuric spots. In the great majority of cases it begins to fade in 1 to 3 days. Herpes is occasionally present. In the early stages superficial and deep reflexes are usually exaggerated. As the disease progresses these become less marked and may be lost entirely. They are not infrequently unequal, especially in the later stages. Early the pupils are usually equal and react to light and accommodation; later they often become fixed and may be unequal. Photophobia is quite common in the early stages. There is usually constipation in older children and adults. The temperature is irregular in type but does not show the wide variation of the usual septic temperature.

At the onset of the disease the pulse is generally a little slower than the elevation of the temperature would indicate; in the later stages it becomes more nearly in proportion to the temperature. The respiration is not significant early; late in unfavorable cases Cheyne-Stokes respiration often occurs. The mental condition shows a wide degree of variation. In mild cases the mentality may be normal throughout. In more severe forms there is marked irritability, delirium, apathy or stupor.

While a bacteremia is undoubtedly present early in practically all cases, the organisms have a predilection for the meninges and speedily localize there. In the septicemic type of meningitis, however, there is usually an invasion of the blood stream for several days or even weeks before a meningitis develops, and the septicemia may continue

after the development of the meningitis. In other cases the meningitis develops early and the septicemia and the meningitis continue together. In still other cases there is a prolonged meningococcemia without the development of the meningitis. These are comparatively rare.

In very young children the early signs and symptoms of meningitis indicate a disturbance of the gastrointestinal rather than of the central nervous system. The disease begins rather abruptly, often with vomiting, almost invariably with greenish slimy stools, irregular fever, and irritability. The fontanelle practically always shows increased pressure. The child does not respond to the ordinary methods of treatment for gastroenteritis, but it is not until the disease is fairly well advanced that stiffness of the neck, opisthotonos and changes in the reflexes develop. The case therefore is usually diagnosed and the serum treatment is begun late in the disease. It is for this reason, I believe, that the mortality in the first year of life is so high. Our mortality has been about 45 per cent. Debré said: "In times of epidemic think of meningitis and do a lumbar puncture on every infant sick without apparent cause." It is even more important in our opinion to do this when there is no epidemic.

Whenever a patient shows signs of meningeal irritation, there should be no delay in doing a lumbar puncture. It is only by the examination of the spinal fluid that a definite diagnosis can be made. The symptomatology of all forms of purulent meningitis are so similar that the bacteriological examination of the spinal fluid is essential for the diagnosis. Early cases of poliomyelitis often present a picture not unlike that of early meningitis. The same is true of meningism with a variety of diseases. In the case of meningism, the relief of the increased intracranial pressure is of sufficient therapeutic value to warrant a lumbar puncture, in addition to its value in diagnosis.

UNUSUAL FORMS MENINGITIS	
M. CATARRHALIS	3
PYOCYANEUS	3
TORULA	2
FRIEDLANDER	2
SPOROTRICHA	1
ANAEROBIC BACTERIA	6

PNEUMOCOCCUS	TYPES
31	I
18	II
27	III
39	IV
115	TOTAL

MENINGITIS-AGE-ETIOLOGY.

AGE	EPI.S.M.	T.B.	PNEUMO.	STREP.	INF.	STAPH.	B.COLI	MISC.	TOTAL
1-2-3 MO.	28	5	7	13	3	0	2	4	62
4-5-6 MO.	75	29	7	9	12	0	0	2	134
7-12 MO.	92	102	14	3	13	2	1	8	235
TOTAL UNDER 1 YR.	195	136	28	25	28	2	3	14	431
1-2 YR.	86	183	13	5	19	1	1	4	312
2-3 YR.	51	107	8	11	9	1	0	5	192
3-5 YR.	118	150	14	11	7	4	0	6	310
5-10 YR.	204	135	29	48	5	0	1	8	430
10-20 YR.	198	87	18	22	3	6	0	14	348
OVER 20	168	73	51	23	1	5	0	13	344
AGE UNKNOWN	0	12	1	2	2	0	0	2	19
TOTAL	1020	893	162	147	74	19	5	66	2386

FIGURE I

Figure I shows the distribution by age and etiology of more than 2,000 cases of meningitis. During the period in which these cases have been collected, nearly 20 years, there has been no severe epidemic in New York City. In 1917 and 1918, there was a sharp increase in the number of cases, and in 1928–1929, there was an epidemic of rather mild proportions. It shows also that meningitis of all forms is essentially a disease of childhood, and in the case of meningococcus meningitis, by far the largest number of cases occurs in the first year of life. Of course in times of war there are epidemics of meningitis among the young adults collected in the army camps.

In tuberculous meningitis the greatest number of cases occurs in the second year of life. In most instances of the other forms of purulent meningitis, the disease is probably secondary to a focus of infection elsewhere in the body, but it is sometimes difficult or impossible to locate it by clinical examination.

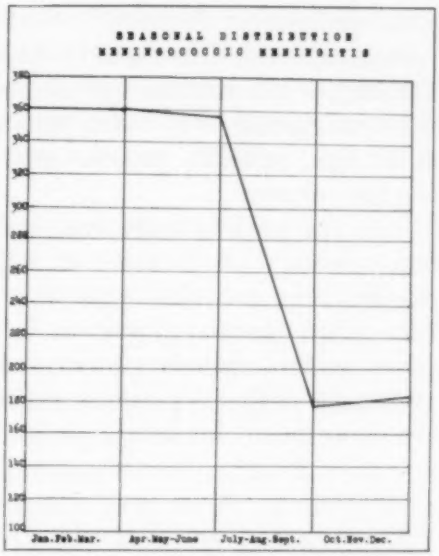

FIGURE II

Figure II shows the seasonal distribution of our cases of meningococcus meningitis over a period of 20 years. It will be seen that by far the larger number of cases occurs in the first 6 months of the year. The incidence is somewhat larger among males than females. Of 1,007 cases, there were 584 males and 423 females. Meningitis is a disease to which there is apparently a high natural immunity. In our experience, there have been only 24 instances in which there was more than 1 case in a family, or a clear history of exposure. Of these, 10 occurred in 1916, 1917, 1918 and 1919, and 10 in 1928–1929. The reason for this immunity is problematical, but it may be noted that it apparently exists also in the case of poliomyelitis and epidemic encephalitis. Unfortunately, there is no test for this immunity as there is for scarlet fever and diphtheria.

The spinal fluid in meningococcus meningitis is practically always increased in pressure and amount unless there is blocking, and it shows a varying degree of turbidity. Very early in the disease or in the fulminating type, the fluid may show very little cellular reaction. In

the fulminating type there may be enormous numbers of organisms with a nearly clear fluid. As the disease progresses, the number of cells is greatly increased, with polymorphonuclears of 80 per cent or more. The actual cell count is of relatively little value. The number of cells may vary greatly in different portions of the spinal fluid and a high cell count has by no means an unfavorable prognosis.

In examining the spinal fluid the specimen should be centrifuged and smears and cultures made from the sediment. The smears should always be stained by the Gram method. A tentative diagnosis only should be made from the stained specimen, as the Gram positive organisms in other forms of meningitis may decolorize readily in some instances. Cultures should be made on a variety of mediums. Miss Gosling, of our laboratory, has found that a semi-solid medium with 1 per cent glucose, 0.25 to 0.5 per cent agar in beef broth, pH 7.2 to 7.4, is the most suitable, both for isolating the meningococcus and preserving the culture.

As the patient improves, the organisms become more and more intracellular and decrease in number. The protein is increased in varying amounts; the sugar may be normal very early in the disease, but as the disease progresses it practically always is decreased and may become entirely absent. As improvement begins, the protein content usually decreases and the sugar content increases—the latter we consider an important prognostic sign. In some instances it has been noted that a decrease in sugar has preceded the return of organisms when a relapse was about to occur. The identification of the meningococcus is most surely made by the fermentation reactions. It ferments glucose and maltose. A slide agglutination with the antimeningitis serum is also of value. It is well known that the meningococcus is divided into different types, but they are by no means so clear cut and definite as in the case of the pneumococcus.

During the recent outbreak in New York City, most of the strains fell into Gordon Type I, but there was a good deal of cross agglutination with Type III. It may be recalled that in his original work Nicolle described a Type A as equivalent to the Gordon I and III. The different groupings that have been described by various workers serve to emphasize the difficulty of exactly classifying the various strains. In sporadic cases many cultures are found that fail to fall into any group.

Antimeningococcus serum has been accepted in the treatment of meningitis for about 23 years, and for more than 20 years its use has been very general. It seems a little strange that in spite of this long period there should still be so much difference of opinion in regard to

its proper administration with respect to route, frequency and amount. There are several reasons why this is so. One reason is no doubt the fact that at times serum of poor quality has been used, and in an attempt to save life it has been given in large and frequent doses when a more conservative treatment had been ineffective. When this more intensive treatment also failed, the physician knew little more than before in regard to the relative merits of the two methods. Another reason is, no doubt, that the type of the disease has differed quite markedly in different outbreaks. In certain outbreaks the septicemic form of the disease has been very common. In perhaps the majority of cases, this form is relatively rare. A third reason probably lies in the fact already stated, that each case of meningitis must be studied and treated more or less on its own merits. One can therefore gain a comprehensive view of the disease only after quite extensive experience. It is a great mistake to draw conclusions from the observation of only a few cases.

Our opinion in regard to the treatment of meningitis is based on an experience of 20 years with more than 1,000 cases. During this time we have compared our results with those obtained in institutions where much more radical methods of therapy were employed. Our method is usually as follows: whenever a lumbar puncture yields a cloudy or hazy fluid, antimeningococcic serum warmed to body temperature is immediately administered by gravity. Further serum treatment will depend on the cultural examination of the fluid, but all cases of purulent meningitis are treated as being of the meningococcus type until they are proved to be caused by some other organism. Intraspinal administrations of serum are continued about every 24 hours until at least two successive specimens of the fluid show no organisms by smear or culture.

The dose of serum is usually 20 c.c. if as much or more fluid has been obtained. If the amount of fluid withdrawn is great and the serum runs in easily by gravity, without untoward symptoms on the part of the patient, 30 to 40 c.c. may sometimes be administered. On the other hand, in certain instances when only a small quantity of fluid is obtained we may inject more than the amount of fluid withdrawn provided the serum runs in easily and no unfavorable symptoms result. It is desirable to drain the subarachnoid space as completely as possible before injecting serum, but if the fluid is under greatly increased pressure, care should be taken to withdraw it slowly. Using this precaution, 50 to 60 c.c. or more of fluid may be safely withdrawn. If headache develops during the removal of the fluid, it usually quickly disappears when the serum is injected. Almost the only condition

under which we inject serum oftener than once in 24 hours is when the fluid is under so greatly increased pressure that a puncture at more frequent intervals seems indicated to relieve it. This rarely occurs.

Some physicians have recommended graduated doses of serum for young children, depending rather arbitrarily on the age. We have not found this necessary. We depend rather on the amount of fluid withdrawn and the ease with which the serum runs in by gravity in determining the size of the dose, but it is necessary to exercise more than ordinary care in removing fluid and injecting serum in young babies.

It is rarely safe to give fewer than 4 doses of serum. A case of average severity will require perhaps from 6 to 8 doses, and cases are occasionally seen where 20 or more are necessary before the fluid becomes sterile. As stated, the serum treatment is continued until 2 successive fluids are free from organisms. This is by far the most important indication for stopping treatment. Another indication, of less value, is the return to normal of the spinal fluid sugar. The cell count of the spinal fluid is, by itself, of comparatively little value. When two sterile spinal fluids have been obtained it is usually safe to stop the serum treatment, temporarily at least. It is often necessary to do several lumbar punctures during convalescence for the relief of pressure, and these fluids should be carefully examined and cultured, as the return of organisms would indicate additional serum treatment. I have emphasized the laboratory tests as a guide to the administration of the serum, as it is rare indeed that the clinical picture is not accurately reflected or even predicted by the changes in the spinal fluid. If, however, the symptoms do not improve after the fluid becomes sterile, and the serum has been temporarily discontinued, it is well to resume the injections, as they may be due to a localized meningitis with adhesions which may be favorably influenced by the continued use of the serum.

If signs of blocking develop, recourse should be had to ventricular or cisternal punctures and the administration of serum by these routes. In babies where the fontanelle is still open, ventricular puncture is to be preferred to cisternal as it is less dangerous and more certain of success, since the block is quite as likely to be above the cistern as below it. We have occasionally encountered cases where little or no fluid has been obtained by lumbar puncture and yet serum has run in easily by gravity, and there have not been signs of increased pressure. Several such cases have made satisfactory recoveries without resorting to ventricular or cisternal punctures.

We are, perhaps, more conservative than many in doing ventricular or cisternal punctures. I have never seen any immediate harm follow

a ventricular puncture. On the other hand, comparatively few babies where this treatment has been necessary have recovered. I do not believe that we know at present what may be the after effects of the repeated trauma to the brain tissue. As regards cisternal punctures I do know that death has occasionally followed promptly, due to hemorrhage. It seems unfortunate that these fatalities are not reported, as we not infrequently read accounts of large series of cases without accident written by physicians using this technic in patients with syphilis of the central nervous system. The dangers are much greater, I believe, when there is an active inflammatory process with layers of adhesions in the neighborhood of the cistern, as is likely to be the case in meningitis. Cisternal punctures should be attempted only by those who have had adequate practice on the cadaver.

In regard to the intravenous or intramuscular injection of serum, we believe that this is indicated only in cases of meningococcus septicemia without meningitis, or in those cases of meningitis which show a prolonged invasion of the blood stream by the organisms as indicated by repeated positive blood cultures or a rash that shows a tendency to persist or to recur. While it is probable that in practically all cases of meningitis there is an invasion of the blood stream early in the disease, we think that in the very great majority of cases this invasion is transitory and that injections of serum other than intraspinally are unnecessary. In some instances this has been proved by blood culture and in many more it has been very definitely established by the rapid fading of the rash and the clinical improvement of the patient. The intravenous administration of serum is not without danger, as a severe or fatal reaction occasionally follows. Several such instances have been brought to our attention. Certainly patients tolerate serum much better by the intraspinal than by the intravenous route.

In cases that run a chronic course and in the occasional case that does not tolerate serum, we have used an autogenous vaccine, often with apparently good results. We have given the vaccine both subcutaneously and intraspinally. We are not prepared to claim too much for it as in some cases no benefit has followed its use. My colleague, Dr. Appelbaum, has recently reported a case in which an autogenous vaccine was administered both intraspinally and subcutaneously after sensitivity to serum developed. The patient recovered.

The general treatment and nursing of patients with meningitis are most important. They should be disturbed as little as possible, and if they are restless, sedatives must be administered. Adequate nourishment should be given and the fluid intake must be sufficient. Care should be taken to prevent acidosis. Retention sometimes occurs, so

that catheterization is necessary. Constipation is the rule and enemas or high colonic irrigations are better than purgatives.

Our mortality has varied considerably in different years. From July 1, 1917, to July 1, 1918, 112 patients were treated with a mortality of 19 per cent. From July 1, 1918, to July 1, 1919, 78 patients received treatment with a mortality of 20.5 per cent. Our average mortality has been higher than this. The last 100 cases that were treated under our supervision showed a mortality of 23 per cent. Of the 23 patients who died, 4 had only 1 or 2 injections of serum. One of these had pneumonia also; 5 others had pneumonia either immediately at the onset or during the course of the disease; 1 showed congestion of the lung which was apparently developing into a pneumonia; 1 had a complicating endocarditis; and 1 a brain abscess.

Meningitis is certainly a very serious disease and every effort should be made to produce a more effective serum. We have done some experimental work in producing an antibody. The results are encouraging but the preparation of the antibody is still in an experimental stage.

The sequelae of meningitis are serious but fortunately relatively uncommon. The most important and frequent sequela is deafness. In following up our recovered cases some years ago, we found that nearly 8 per cent had an impairment of hearing or were totally deaf; 2.1 per cent had defects of vision. This usually takes the form of panophthalmitis and is usually limited to one eye. Mental deterioration is most unusual unless there is a hydrocephalus. Paralyses may occur in the course of the disease, but except for strabismus, they usually disappear. A transverse myelitis is very rare.

The response of many patients to serum treatment is almost spectacular and the results are highly gratifying.

Medicine and the State

SIR ARTHUR NEWSHOLME'S address to the recent public health congress at the Agricultural Hall gave rise to a lively debate, interesting in that the speakers put forth their views in plain and unmistakable language; amusing, because of the differences of opinions expressed, but withal somewhat vaguely depressing, for it showed that in this year of Grace, the fundamental function of the State to conserve health is almost entirely overshadowed by its interest in caring for the sick.—*Med. Off.*, Dec. 6, 1930, p. 245.

Practical Problems in the Serum Therapy of Meningococcus Meningitis*

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THE specific therapy of any infectious disease depends upon its pathology in the broadest sense—the character and virulence of the incitant, its distribution in the tissues, and the nature and extent of the pathological processes in the various tissues and organs of the body. Fundamentally, it depends upon the subtle cellular susceptibilities of the invading parasite on the one hand, and of the tissues of the host on the other; hence the importance of information concerning the meningococcus and its various activities in relation to the human subject as a susceptible or relatively insusceptible host. Such information is, unfortunately, quite fragmentary but none the less significant.

Our knowledge of the virulence and pathogenicity of the meningococcus in the experimental study of animal infection is meager because it has been difficult until recently to differentiate between the toxic effects of cultures inoculated into animals and the changes induced as a result of infection, with the development of the organism in the tissues. The widely varying severity of the disease as illustrated by the mild and the fulminating, toxic forms indicates widely varying degrees of susceptibility in the human subject. The fact that in epidemics only a comparatively small proportion of the population is involved, and that the cases are often scattered, suggests general, though relative, insusceptibility. The distribution of the disease processes, largely limited to the meninges, and the comparatively infrequent occurrence of true metastatic involvement of other tissues, despite the bacteremia,† indicate, on the whole, a rather limited susceptibility of the human subject. Nevertheless, the epidemics of fulminating cases must be due largely to the presence of highly susceptible individuals in a crowded community, which is not usual.

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* Read before a Special Session of the Laboratory, Epidemiology, and Health Officers Sections of the American Public Health Association at the Fifty-ninth Annual Meeting at Fort Worth, Tex., October 27, 1930.

† Complications or sequelae, however, are not so uncommon.

Were it not for these facts, the severe outbreaks in epidemic form would more reasonably be attributed to the introduction and spread of a particularly virulent strain of meningococcus. Moreover, our studies, as well as those of other laboratories, have failed to identify any one strain that has been associated with the outbreaks on the Pacific Coast, in Chicago, Indianapolis, Detroit, or elsewhere in this country. Finally, the disease is now so generally endemic the world over that conditions of host susceptibility and crowding, especially in large industrial centers and in military camps, must be considered the determining factors in the absence of further data concerning the bacterial incitant.

Since the early work of Weichselbaum, the meningococcus has been detected in the pharynges of patients and also of healthy persons. From this focus infection spreads, involving the meninges, as pointed out by Weichselbaum and others, and also the blood stream as a bacteremia. Since the important studies of Herrick, the bacteremias have been considered especially significant. The dissemination of the organisms from person to person by the secretions of the upper respiratory tract must be quite readily accomplished and it has been found that the number of carriers is in direct proportion to the number of cases. Furthermore, it is evident that each case arises from contact with either a case or a carrier; hence the importance in severe epidemics of the investigation of carriers. Although the practical value of such work is not apparent, the various studies of the carrier state have indicated quite definitely the effect of crowding on the dissemination of the organism. The relative insusceptibility of the human subject and the fact that the carrier state is not usually so persistent as it is in other infectious diseases, such as diphtheria and pneumonia, doubtless account for the practical results obtained by simple measures to prevent crowding as compared with the complex search for, and isolation of, every carrier, a procedure which has not been proved necessary in outbreaks that occur in the civil population.

There has been a definite increase in the number of cases of meningitis in New York State since 1926, which, in view of the outbreaks in different sections of the country, has caused some concern. The Commissioner, Doctor Parran, at the suggestion of the Public Health Council, called a conference in May, 1930, in order to obtain complete information concerning the situation in various parts of the country. From the discussions and from our studies of the meningococcus strains, it is evident that, although no one strain has been recognized as responsible for any of these epidemics, from the standpoint of effective serum therapy, the relationship of the potency and valency of the

specific serum to the strain giving rise to the disease is of fundamental importance.

Strains of meningococci vary greatly in their serological and immunological reactions, the recently isolated strains often agglutinating only slightly or not at all; hence tests of the potency of the polyvalent serums with these non-agglutinable strains are often misleading—that is, fail to indicate whether or not the potency and valency of the serums are sufficiently high and broad to include these particular strains. In general, failure to agglutinate is an indication of lack of potency and valency in the serum but if the strain is in a non-agglutinable state the results may not be significant. In some instances, strains which were not agglutinated when first isolated were agglutinated later in the polyvalent serum. Not only do different strains agglutinate in widely varying degree but their antigenic action varies also when tested in the immunization of animals. The determination and study of the various strains of the meningococci are of the utmost importance in the investigation and control of epidemics and the serum therapy of the disease. Strains which are most representative of the different groups in their agglutinability and antigenic action are the strains which should be used for the production of antimeningococcus serum that is intended for the treatment of the disease. The determination of the strains giving rise to outbreaks of the disease is important in order to be sure that the therapeutic serums possess adequate potency and valency.

The specific serum therapy of the disease is based upon the early work of Jochmann and of Flexner,[1, 2] who introduced the intraspinous injection of the serum, which proved in the extended studies of Flexner to be the effective method of specific treatment. The intraspinous method has been supplemented recently by intravenous injection of large quantities of this serum as a result chiefly of the work of Herrick, which demonstrated the importance of bacteremia, particularly in the early stages of the disease. Although undoubtedly a most valuable aid at times, treatment of the bacteremia by intravenous administration should not be so overstressed that it detracts from the more important introduction of the serum into the meninges, the real seat of the disease.

The importance of obtaining a broadly valent serum was recognized early by Flexner, Amoss, and others. Not only were representative strains of all groups of meningococci selected for the immunization of horses, but whenever a case failed to respond to serum treatment and the organism isolated from the spinal fluid failed to agglutinate in the serum, it was added to the series of cultures used in

the immunization. Thus, a broadly valent serum was assured and the reports of treatment were so favorable that it was generally adopted, not only in this country but also abroad. Unfortunately the antimeningococcus serums generally available for the treatment of cases lacked the potency and valency of the serums which Flexner used and the results of treatment with them have not been so encouraging. In many quarters the use of the serum has been practically abandoned, especially wherever there has been no improvement in potency and valency. During or toward the close of the World War, Amoss published a series of comparative tests of the different serums sold in the United States. Independently we made a series of similar tests with similar results. Our serum proved practically identical with Flexner's since the same strains and methods were used in its production, and the Flexner serum was used as a standard for the comparative testing of potency and valency. The results of these investigations were transmitted to the federal authorities and led to federal and state regulation of antimeningococcus serum, the distribution of standard cultures, and a control serum for comparative test of potency and valency. The federal standards have been advanced steadily since that time. Abroad there has been little or no effective standardization of these serums. Judging from information I was able to glean from a few personal conferences in Europe this summer, both in England and on the Continent, the results of serum therapy in meningitis have not been encouraging, to say the least.

When the laboratory first undertook the preparation and distribution of antimeningococcus serum for New York State the strains and methods of Flexner were adopted but, since many recently isolated strains failed to agglutinate and lacked antigenic activity, a thorough investigation of all the strains was made to determine which were most effective antigens and how many of them should be used in the immunization of horses to obtain serum of the highest potency and broadest valency. As a result of these investigations,* published 10 years ago, it was found that both potency and valency might be increased by the proper selection of the strains and a reduction in the number to 4 or 6 of those which had proved to be the most effective antigens in the immunization of horses.

In view of the fragmentary knowledge of the virulence and pathogenicity of the various meningococci and the inadequacy of the available methods of standardization of serums in the laboratory as an indication of therapeutic potency in the treatment of cases, the change in method based upon these investigations seemed a very radical step. Accordingly, the serum was distributed to important medical centers

in order to obtain the most accurate and discriminating clinical opinion as to the therapeutic results. The reports were most encouraging and satisfactory in every particular, and it was evident that a real advance in the preparation of this serum had been made.[4] The reports for the past 10 years have uniformly confirmed this conclusion. Statistical comparisons of the results of the serum treatment of meningitis which have been reported in the literature have not been very satisfactory. The mortality varies greatly in different localities and in different series of cases, as well as the conditions under which they have been treated. Then, too, there has been no satisfactory standardization of the serums so that definite information concerning the tests of potency and valency of the serums used is not available.

Perhaps the most striking instance of the comparative potency of the 6-strain serum which we are now distributing is to be found in the report on a series of cases treated at the Post-Graduate Hospital in New York City by Wright, DeSanctis, and Sheplar.[5] These came from one district in New York City and were evidently severe. The first 10 were treated with different commercial and other serums. All died. The remaining 34 received this 6-strain serum, with only 4 deaths: 2 were moribund when treated and 2 developed pneumonia. It is important to note that subsequent experience indicated that conditions relating to the character and severity of the cases had not changed, nor had the relative effectiveness of the serums which were substituted at intervals when the distribution of the 6-strain serum to the hospital was withheld. However, a much larger number of cases treated under as uniform conditions as possible is required to obtain significant comparative results.

The potency and valency of the serum used in the Flexner series and that used in ours were accurately determined by the accepted laboratory test of agglutination and in comparison with control serums, which indicated that the 6-strain serum as compared with the 20- or 60-strain serums previously used[3,4] had a definitely higher potency and broader valency for practically all groups of the meningococci which it was practicable to study. Hence I consider most significant the comparison of 606 cases treated with this serum between 1920 and 1930, and the 1,300 reported by Flexner in 1913.[6] In our series to date the mortality is 17.8 per cent; in Flexner's, 30.9 per cent, as compared with his estimated mortality in untreated cases of about 70 per cent. Among our 606 cases, however, there are 20 which I think should be eliminated—14 received their first dose of serum 48 hours antemortem—making the revised fatality rate 15 per cent in 586 cases.

The clinical reports, the statistical comparisons of the mortalities

in large series of cases, and the results of comparative testing in the laboratory all indicate the advance that has been made in the preparation of antimeningococcus serum.

To summarize the conclusions which are of practical interest to the health officer: Meningococcus meningitis develops as a result of contact with a case or a carrier, but only in susceptible persons. Crowding, coupled with the stress of industrial centers, or of military campaigns, is the most important condition favoring the spread of the disease in epidemic form, which is quite generally endemic the world over. In the outbreaks in this country during the past 3 years no particularly characteristic strain has been recognized as the incitant. The different strains vary widely in their virulence or toxicity, their agglutinability—especially when recently isolated—and their antigenic action as immunizing agents. In December, 1917, New York State established, and has since maintained independently, minimum standards of potency definitely in advance of those of the federal government. It is essential that the serums for specific treatment be prepared by immunization with a limited number of strains which are the most representative and most active antigenically. The minimum standards should assure the highest degrees of potency and valency. The agglutination of such serums against recently isolated strains is not a reliable criterion of therapeutic potency. Standardization by the agglutination reaction with standard strains and control serum, however, is generally quite reliable.

The serum is given intraspinously, the dosage depending upon the amount of fluid withdrawn. It should be given slowly and at intervals of approximately 12 hours until there is definite evidence of improvement. Intravenous administration of even larger doses during the earliest stages may be helpful but should only supplement and not supplant the intraspinous treatment.

REFERENCES

1. Flexner, S. Concerning a Serum Therapy for Experimental Infection with Diplococcus Intracellularis. *J. Exper. Med.*, 9: 168, 1907.

2. Flexner, S., and Jobling, J. W. Serum Treatment of Epidemic Cerebrospinal Meningitis, *J. Exper. Med.*, 10: 141, 1908.

3. Wadsworth, A. B. Comparison of the Potency of Polyvalent Antimeningococcus Serum Produced with Four and Six Representative Strains and That Produced with Sixty Strains as Determined by the Agglutination Titer, *J. Exper. Med.*, 33: 107, 1921.

4. Wadsworth, A. B., and Kirkbride, M. B. Comparison of the Potency, Polyvalency, and Therapeutic Action of Antimeningococcus Serums, *Am. J. Hyg.*, 6: 507, 1926.

5. Wright, I. S., DeSanctis, A. G., and Sheplar, A. The Determination of the Value of Serum in the Treatment for Meningococcus Meningitis, *Am. J. Dis. Child.*, 38: 730, 1929.

6. Flexner, S. The Results of the Serum Treatment in Thirteen Hundred Cases of Epidemic Meningitis. *J. Exper. Med.*, 17: 553, 1913.

Control Measures Adopted for Epidemic Cerebrospinal Fever on Ships*

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EPIDEMIC cerebrospinal fever occurs with piquant irregularity. Indeed, since the outbreak of 1904–1905, this disease has been sometimes epidemic, sometimes sporadic without complete cessation. Europe, Africa, South America, Australia, and China have been harassed. In other words, the disease has been pandemic practically over the world between 1904 and 1910 with never a really quiescent period in the United States or Europe. In fact, in the United States, each winter, in one locality as another, groups of cases have occurred. There is no doubt that severe epidemics leave viable focuses which add to the continuity of the propagation of the disease. The meningococcus only survives in nature in the human being. The epidemiology is by no means as simple as it seems. The epidemiology of pneumonia has often been contrasted with that of epidemic cerebrospinal fever. Apparently, the latter only reaches epidemic proportions not so much through case contact as from chronic carriers. Constituting as they do often unsuspected and innocent participants, they become malevolent agencies in the spread of the disease usually in the vicinity of cases. The carriers generally outnumber the cases many to one; consequently their detection and control—mainly because of the fact that the meningococcus is decidedly selective in medium, infinitely sensitive to environment and technically difficult to recognize culturally—make bogy-haunted creatures of the painstaking and careful health officials. The sporadic character of many of the cases indicates a widespread resistance to the disease in the general population. This assumed resistance may be to the causative germ itself. The low case incidence is, however, laid at the door of the carrier, for it is stated, and often accepted, that the case incidence is dependent on the carrier incidence, reaching a comparatively high ratio, around 20. That this does not always hold true can be shown by the carrier incidence found aboard ships on which cerebrospinal fever had oc-

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curred in 1928 and 1929. This was exceedingly low (2.5 to 4 per cent) even in the face of the known close contact so apparent in the type of steerage. Therefore, in some outbreaks, there may be an increased susceptibility, racial or other, to the particular causative type strains, and this was probably true in the Filipino cases that occurred on ships and elsewhere. Certainly, when large numbers of people are brought together from scattered communities, the presence of a carrier may be a foregone conclusion. Of practical importance are the measures to control and culture carriers. The results have not been brilliantly conclusive even under controlled conditions as in military camps. The carrier state is conceivably one important condition for consideration. It may persist for weeks but obtaining accurate results by the accepted present-day laboratory technic is decidedly uncertain. Therefore, control measures cannot be based alone on carrier detection. In fact, the health official must assume an expectant attitude in regard to all alleged control measures.

The history of cerebrospinal fever shows periods of high incidence recurring at fairly long intervals. The Great War years, 1915–1918, could be considered an epidemic period, also 1928–1929. The future is problematical. In the period 1913–1916, the case incidence could be considered low, or our normal expectancy 2 cases per 100,000 population. In 1918, it was 6 times greater than the assumed expectancy. The present increased incidence began about 1925. The City of New York showed, in 1928, a higher mortality rate than in the previous 18 years. The City of Chicago reported similar increased incidence.

Public Health Reports[1] stated in summarizing the situation that "the reported incidence of meningococcus meningitis for January, 1929, represented the highest attack rate for that disease since 1918." No mention was made of the Pacific Coast states. California, as well as Oregon and Washington, reported a decided rise in number of cases in 1926. In fact, this increase was manifest in Oregon in 1925. The important thing to observe is that the increased incidence was maintained for 1927 and 1928 for reported cases, and deaths reached the maximum in 1929 and declined in 1930. Likewise, cases were continuously being reported throughout the summer months for these periods. For instance, Washington reported in 1925, 55 cases and 39 deaths; in 1926, 190 cases and 84 deaths; in 1927, 162 cases and 95 deaths; in 1928, 123 cases and 95 deaths; in 1929, 304 cases and 116 deaths; and for January to August, 1930, 136 cases and 46 deaths. Oregon reported in 1925, 86 cases and 37 deaths; in 1926, 99 cases and 65 deaths; in 1927, 89 cases and 35 deaths; in 1928, 76 cases and 36 deaths; in 1929, 64 cases and 42 deaths; and for January to Au-

gust, 1930, 17 cases and 11 deaths. Oregon's definitely high mortality rate may be explained by incomplete reporting. California reported in 1925, 97 cases and 30 deaths; in 1926, 192 cases and 91 deaths; in 1927, 222 cases and 91 deaths; in 1928, 224 cases and 93 deaths; in 1929, 737 cases and 381 deaths; and for January to August, 1930, 268 cases and 120 deaths.

The situation as to cases in steerage passengers appeared at first to be not serious, and gave little concern to health and shipping officials. The disease was practically limited to steerage passengers of one line and mainly prevalent in one nationality, the Filipino, whose individual resistance to the causative strain of organism was probably low. The two Pacific Coast ports most affected were Seattle and San Francisco. Between November, 1928, and May, 1929, there occurred among the steerage passengers on 16 ships of one transportation company en route to these ports from the Orient, 193 cases of acute cerebrospinal fever; 166 of these were Filipinos; 21 Chinese; 2 Japanese, and 4—2 of which were Chinese—members of the crew. Many of these died at sea. It was interesting to note that cases were found on 5 ships on 2 different trips. These trips approximate 60 days in length. On 3 ships there occurred a small number of cases on the first trip. On the next trip from the Orient, they were remarkably increased, reaching 43. There were no cases reported on any of the trips to the Orient from the States. Search of the crew of 2 ships for carriers on two occasions revealed a few who were promptly removed before sailing. Both ships had, however, further cases of meningitis in Filipino steerage passengers on their return from the Orient. Until such measures as laboratory search for carriers and reasonable control of contacts were fully established in the ports affected, contact cases in the general population appeared, probably as a result. Such contact cases should primarily be most prominent in resident Filipinos.

Oregon, however, reported for 1929 only 1 case and 1 death in Filipinos and that in April; Washington reported 26 cases or approximately 10 per cent of the total, and 3 deaths in Filipinos exclusive of ship cases; and in California—where data are available as to Filipino nationality only in the City and County of San Francisco, the County of San Joaquin, the County of Monterey, and the City of Sacramento —San Francisco reported, January to June, 1929, 15 cases in Filipinos exclusive of ship cases; Monterey County 33 cases; San Joaquin County 14 cases and 6 deaths; and the City of Sacramento 3 cases since the beginning of 1929. The available data would indicate that there were 65, or approximately 10 per cent of the total, possible contact cases in Filipinos in California for the above communities and

period under discussion. If it were possible to determine the population contact rate of Filipinos for cerebrospinal meningitis in California and Washington they would perhaps be comparatively high.

Previous to and coincident with meningitis, and since the epidemic period which has apparently passed, unexplained upper respiratory infections and numerous cases of pneumonia, both bronchial and lobar, have occurred in Filipinos on ships, but not on every ship. No explanation for this is offered but this important matter is under consideration for further study.

Apparently, the measures advocated by health officials and presumably adopted by the American shipping company involved have been efficacious, for all ships have arrived "clean" since sailing from Manila as far back as May 11, 1929. Information is available, however, that the epidemic that had been prevailing in Shanghai passed its peak in April, 1929. The declining epidemic incidence in this port, which is touched by these ships, and the prevention of contact of evidently highly susceptible Filipino steerage passengers with possible cases and carriers in Shanghai, are of doubtful significance in the light of the absence of recent cases on shipboard. On the other hand, the epidemic in the port of Shanghai may be only an epidemiologic expression of localized prevalence similar to that which has occurred in various ports of the United States. There seems to be no doubt, however, that Shanghai was visited in April, 1929, by a severe outbreak, and the disease reappeared to a lesser extent about the same period or slightly earlier in 1930.

President Hoover's executive order of June 21, 1929, and the regulations of the U. S. Public Health Service made effective in July of the same year drastically reduced the steerage capacity of these ships 75 per cent. Subsequently this was increased to 50 per cent and has since remained unchanged. Only one transportation company was actually involved. This company specialized in transporting Filipinos, and the racial susceptibility to the causative strains was probably high. Curiously, little if any meningitis has been reported from the Philippines (only 3 cases and 2 deaths in the Filipino concentration quartel for embarkation). This has led to the epidemiologic assumption that the interchange by travel, or the large amount of legal and unrestricted migration between the Philippine Islands, the United States, and the Hawaiian Islands, may have produced an increased number of carriers or extended exposure to carriers. Meningitis, at least in various parts of the United States, was definitely showing a steadily mounting morbidity, and this was particularly true of the Pacific Coast and Rocky Mountain states. In this connection, it may

be of interest to quote from the *Communiqué No. 80,* Weekly Epidemiological Record of the Health Section of the League of Nations:

> The epidemic in the United States did not begin on the Pacific Coast but in the Rocky Mountain states and in the City of New York. Thus in 1928, there were serious epidemics in Montana, Wyoming, Colorado, and Arizona. The maximum came earlier in New York City than in California also in 1929. The state which suffered most severely from the epidemic was Michigan, where 1,876 cases were reported in 1929. In New York City, there were 986 cases in 1929. The number of cases reported during the early part of 1930 was nearly as high as in 1929, but the incidence began to decrease already in April.

The assumption that type strains peculiar to the Orient were causative factors in the Filipino cases is not entirely borne out by the type strains isolated from such cases in California. Types I and III reported by Geiger[2] have not heretofore been unknown in the United States and elsewhere. There appears to be no doubt that different strains of meningococcus of the same type may be active in epidemic and interepidemic periods but there is no evidence as to oriental type strain specificity in the Filipino cases. Information is now available from 3 ports, Honolulu, Seattle and San Francisco, for 1928, 1929 and 1930 to date, as to cases brought in on ships of the transportation company involved. For instance, San Francisco, in 1928, showed 9 cases and 3 deaths; in 1929, 58 cases and 22 deaths, and none in 1930 to date. Seattle showed none in 1928, 83 cases and 18 deaths in 1929, and 2 cases and 1 death in 1930. Honolulu, because of labor necessity and geographic location, bore the brunt of the outbreak, if it can be called such, in Filipinos. In 1928 there occurred 14 cases and 2 deaths; in 1929, 136 cases and 55 deaths, and in 1930, 17 cases and 4 deaths to date. The combined number of cases brought into these ports for the periods mentioned was 319 with 105 deaths, a rather surprisingly low percentage case mortality of approximately 33. The largest number of cases occurring on any one ship en route was 43, approximately 6 per cent of the total steerage capacity of this ship.

Apparently, any harmful conditions on these ships as to the control of meningitis were promptly corrected, as shown by the decidedly decreased incidence on them with similar class steerage in 1930; or the disease has passed to more fertile soil than the Filipinos; or the declining incidence in areas of maximum contact such as occurs with Filipinos in the Pacific Coast states is of more than passing significance. Thus, meningitis has reached a quiescent period.

The meningitis situation, perhaps more than any other thing, has directed attention to the need for careful selection of medical personnel on ships and their thorough training in the control of com-

municable diseases and the technic of isolation. The ships in question have what is known as "hatch" type of steerages. Contact is, therefore, very intimate unless properly controlled, and racial characteristics of the Filipino insure that such contact under ordinary conditions is inevitable.

The following recommendations were promptly put into effect and have since been made a procedure of operation for control of any outbreak of communicable disease en route. Regulation No. 13, as to the establishment of an isolation area, proved to be of practical importance, but somewhat financially burdensome, because of loss of passenger space.

1. Careful medical inspection, including taking of temperatures, to be made at port of embarkation of all steerage passengers, and those who are sick with meningitis or undiagnosed febrile conditions, or who have presumably been in contact with cases of meningitis, should be refused embarkation. In epidemic periods, such passengers should be detained under medical supervision for 2 weeks, and if thought desirable, nasopharyngeal cultures taken for the presence of meningococci carriers.

2. En route, ships' surgeons should make a careful inspection of all steerage passengers twice daily, using the clinical thermometer to detect all cases of fever.

3. All those persons showing rise of temperature to be isolated until such time as a definite diagnosis can be made.

4. All cases of meningitis or those suspected of having meningitis should be immediately isolated and continued in isolation until arrival at suitable port of debarkation.

5. The nurse or attendant assigned to cases of meningitis should not care for persons suffering from any other disease.

6. Mess gear used by such patients should be immersed in a disinfecting solution or preferably boiled before being removed from the sick bay. Articles such as gauze, paper napkins, etc., used by the sick should be burned or thrown overboard, if at sea.

7. All general mess gear used by steerage passengers should be sterilized after each meal by immersion in actually boiling water for not less than 5 minutes.

8. Steerage compartments should be kept clean and amply ventilated. The type of ventilation and the amount of air change needed should be properly determined.

9. The captain of the ship should detail one of his officers to supervise, along with the ship's surgeon, the enforcement of the above recommendations and those that follow. The captain should hold these two officers absolutely responsible for the carrying out of these instructions.

10. So long as the situation with regard to cerebrospinal fever is acute, an additional practical or, preferably, a trained nurse should be detailed to each ship from infected ports as a special assistant to the ship's surgeon. Likewise, there should be picked out either from the steerage passengers or from the employees one man from each race to act as assistant to the chief surgeon.

11. That the hospital on the top aft deck should be set aside for the members of the crew with this proviso: that should a case of cerebrospinal fever be present it will not be quartered here as contact with the deck is entirely too prominent.

12. The hospital on the steerage deck should be retained as an isolation hospital for actual cases of cerebrospinal fever.

13. That a section of the steerage passenger quarters be set aside with its unit of wash rooms and toilets to be used as an isolation hospital for those becoming ill with symptoms not recognizable for the moment as those of cerebrospinal fever.

14. Special attendants should be arranged for those in the suspect hospital and those in the hospital proper. The food supply for these must be cooked separately and the dishes handled separately, washed thoroughly, and later boiled. These attendants must not come in contact with the other passengers. In the hospital proper and in the isolation unit there should be facilities for the cleansing and disinfecting of hands and the changing of gowns and masks before leaving cases of cerebrospinal fever. Therefore, it is necessary that the attendants, the doctors and the nurses wear suitable gowns and masks.

15. Individual glasses or paper cups should be supplied to the steerage passengers.

16. Steerage passengers should be made to sleep in opposite directions, that is, feet to head rather than head to head. In epidemic periods, unit isolation may be maintained by the use of canvas stretched between berths.

17. Sputum and vomitus cups should be supplied for each berth.

18. Ventilation should be sufficient but frequent changes must be maintained by the opening of port holes or by the non-closing of the forced draft.

19. Hot water, soap and towels, paper preferred, should be supplied to the steerage passengers every morning and at each meal time.

20. Food should be served on the plate and the passengers not allowed to dip into the general food supply. All dishes should be washed with soap and hot water and rinsed in boiling water. In times of the presence of cerebrospinal fever on board, it might be necessary to set up special hours for meals for each cook and establish specific areas for meals. Under no circumstances at the time of cases of cerebrospinal fever on board should there be allowed intermingling or any social contact as gambling, etc.

21. There should be frequent flushing of the steerage decks with soap and water. It is permissible, of course, to use a disinfectant like lysol, but the former is indicated.

22. No allowance of off-shore leave in infected ports for steerage passengers from the Philippines or members of the steerage crew. No admittance of native peddlers aboard ship.

23. There should be a supply of anti-meningitis serum, lumbar puncture needles, gowns and masks on board for the ship's surgeon and for nurses and attendants. In this connection, each ship's surgeon should receive specific instructions from the chief surgeon as to prophylaxis and control of communicable diseases. The officials of the steamship line should consider keeping their chief surgeon in touch with the ship by radio each day concerning any illness on board. Again, no physician should be employed in the future unless passed upon by the chief surgeon and after having received instructions as to the control and isolation of communicable diseases that may be encountered en route.

24. Under the existing circumstances, the presence of a case or a suspected case of cerebrospinal fever on board any ship should mean an increased and extraordinary activity to prevent its spread. To develop this end the commanding officer should lend his energy and every effort.

25. Should a case of communicable disease like cerebrospinal fever develop en route between ports like Hongkong and Honolulu arrangements should be made with the local health officer and port authorities in Honolulu that such case may be removed, thereby lessening contacts.

26. Once a case of meningitis develops en route in steerage space areas, the passengers in this area should be considered contacts and control measures instituted for the group.

27. Steerage passengers of like nationality should be placed together and, if practical, those from each port of call.

28. Steerage passengers from infected ports should not be accepted unless specific instructions to do so are issued or only when the known precautionary measures are in effect.

29. Disease conditions in ports visited should be ascertained by the ship's surgeon and the information conveyed to the chief surgeon.

REFERENCES

1. *Pub. Health Rep.*, Mar. 1, 1929.
2. *California & West. Med.*, 32: 5 (May), 1930.

Death of Dr. Charles Krumwiede

BY the death of Dr. Charles Krumwiede, Fellow A. P. H. A., for many years assistant director of the Health Department laboratories of New York City, the world of science loses an outstanding bacteriologist whose worth was recognized by scientists of every country. He had in charge the supervision of antitoxins, serums and biological products for the use of the department or generally by practicing physicians, and he made his office an opportunity for widening medical knowledge.

Dr. Krumwiede in connection with Dr. William H. Park carried on in 1910 the experiments with bovine tuberculosis germs which confirmed the proof that they could infect human beings and thus led to the pasteurization of milk in the city and elsewhere in many countries. He devised improved methods for the isolation of the typhoid bacillus. His most recent discovery of importance was that the supposed bacillus of psittacosis, or parrot fever, was not guilty, the real culprit being an invisible filterable virus.

Dr. Krumwiede was at times an instructor in bacteriology in Bellevue and at New York University. He was an honored member of many scientific bodies. He was unknown to the general public, a fine example of the type of modest, quiet, self-effacing scientists in government employ who for little pay and with scant applause do work of immense value to their community and their time.—*The World*, New York, N. Y., Dec. 31, 1930.

Incidence and Source of Epidemic Meningitis on the Pacific Coast 1929*

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THE year 1929 was a fruitful one for epidemic meningitis, not only in certain western states but also in other parts of the United States, as well as in certain areas of the Orient.

It is not the purpose of this paper to deal with the epidemiology of the disease, but it is pertinent to point out that meningitis showed a higher rate than in any of the preceding 7 years. It was twice that of 1928, and more than 3 times that of any other year since 1925. This disease tends to occur in cycles and the large number of cases in 1929 was due to the gradual building up over a period of 5 years, as each succeeding year had shown a higher incidence than the preceding one. The crest of the epidemic wave was reached in the Pacific Coast states in 1929, but the disease continued prevalent in some adjacent states of the Rocky Mountain area until the spring of 1930 when subsidence was noted.

In addition to discussing the incidence in Pacific Coast and adjoining states, brief mention will be made of the occurrence of meningitis in the Orient and on ships having regular commercial relations between those ports and Pacific Coast ports in the United States. The latter is worthy of consideration as a possible factor in contributing to an increase in the number of cases, particularly in California and Washington.

MENINGITIS IN PACIFIC COAST STATES

There was a serious outbreak of epidemic meningitis in two Pacific Coast and two adjoining states. It is thought that during 1929 there were more cases and deaths from this disease in California than in any preceding year for a long period. There were 260 cases with 101 deaths in 1927, and 259 cases with 115 deaths in 1928. Both of these years showed an increase over preceding ones. The year 1929 showed

* Read before the Western Branch of the American Public Health Association at the First Annual Meeting in Salt Lake City, Utah, June 13, 1930.

the marked rise to 695 cases with 381 deaths. The majority of these occurred in the first half of the year, and from January 1 to August 31 there were 302 deaths distributed according to nationality as follows: Filipinos, 57; Mexicans, 39; Chinese, 16; Japanese, 6; giving 118 Orientals out of the total. According to sex, 218 were males and 84 were females.

The disease has shown a decline in the first quarter of 1930. There were 318 cases from January 1 to April 26, in 1929, against 185 cases for the corresponding period in 1930. Although it occurred in all parts of the state, there were definite sections where undue prevalence existed. The 5 principal ones were: Los Angeles County, 161 cases; San Francisco, 88 cases; Sacramento County, 71 cases; Monterey County, 63 cases; and San Joaquin County, 16 cases. In Los Angeles County the sufferers were whites and Mexicans; in Monterey County the majority were Filipinos employed in canneries or lettuce fields. Of 31 cases reported between January 1 and May 1, there were Filipinos, 19; Mexicans, 4; Japanese, 2; whites, 8. The first case was in a white person, one month before the first Filipino patient was reported. In Sacramento and San Joaquin Counties, a considerable number of the cases were Filipinos.

In San Francisco during the calendar year 1928, there were 37 cases: 35 whites and 2 Chinese. In 1929 there were 88 cases: 65 whites, 17 Filipinos and 6 Chinese. There were no cases among the Japanese. During the first quarter of 1929 there were 48 cases. For the same period in 1930 there were 15, all whites except one Filipino. It will be noted that the number of cases among the Filipinos in 1929 was large in proportion to their number.

The non-local cases developing and treated in San Francisco are not included, as they are not properly chargeable against that city.

The State of Washington showed an increase over 1928, the crest being reached in 1929. This state, like California, has active commercial relations with the Orient, and a number of vessels arrived at Seattle with meningitis among the Filipino steerage passengers. Exclusive of ship cases there were reported 221 cases and 70 deaths in 1929, the highest number for any recent year. The following nationalities were affected: whites, 178; Filipinos, 28; Japanese, 12; Chinese, 3. The cases resulting from infection on shipboard were 83, with 18 deaths: 78 Filipinos, 4 Chinese, and 1 Japanese.

Oregon did not show an increase in 1929 over preceding years; in fact the disease was less than in 1927 and 1928. In 1926 there were 99 cases; in 1927, 89; 1928, 76; and in 1929, 64. There has been a further diminution in cases in 1930. From January to April, 1929,

there were 31 cases; for the first 4 months in 1930, 11 cases. In 1929 all the cases were whites except 1 Filipino. There are few of the latter in Oregon outside of a settlement in Portland, which does not seem to have suffered from the disease to any degree.

INCIDENCE OF THE DISEASE IN ADJOINING STATES

For comparative purposes the incidence in states adjoining those of the Pacific Coast is of interest. In all of these the number of Filipinos is negligible, very few being domiciled therein. Two of these states had a severe outbreak of meningitis in 1929, a larger number of cases in proportion to population than in either California or Washington, where stress has been laid on the Filipino.

In Arizona there were 76 cases in 1928 and a marked rise in 1929 to 287. For the first quarter of 1929 there were 172 cases and for the same period in 1930, 115. While a diminution has occurred it is less than in other sections under consideration. In this state the records do not show the nationality of those affected, but the State Health Officer advises that there are not large numbers of Filipinos and there has not been any prevalence of meningitis among them.

Idaho had 99 cases of meningitis in 1928, and an increase in 1929 to 256. This incidence is high in comparison to population, and the outbreak must be considered severe. It is estimated that not over 10 per cent of the cases were foreigners. There are practically no Filipinos in the state and there was no meningitis among them.

Nevada had little meningitis in 1929, in fact probably not more than could be considered normal. During 1928 there were 17 cases and in 1929, 21. There are few Filipinos and no case of meningitis occurred in this nationality. The disease for the first quarter of 1930 shows no variation from that of the same period in 1929.

MENINGITIS AMONG STEERAGE PASSENGERS ON VESSELS FROM THE ORIENT

A review of the cases of meningitis occurring on vessels from Manila and Chinese ports in 1929 and the years immediately preceding is of interest in showing that the Orient was subject to the same cyclical increase that occurred in the United States. The incidence in the Orient cannot be computed, and the occurrence among passengers embarked at those ports must be considered in substantiation of the opinion advanced.

A study of the cases occurring at the Immigration Station at San Francisco, where Chinese and Japanese passengers are detained, indicates the prevalence of meningitis in Chinese areas, and there is evi-

dence that a severe outbreak occurred in Shanghai. It is believed, however, that Hong Kong was the source in this particular instance, as few steerage passengers are brought from Shanghai and none were embarked at that port during the height of the epidemic. No cases originated at the Immigration Station during the fiscal years 1925 to 1928 inclusive. With the increase of meningitis in the fall of 1928 a different story unfolds, as there were 9 cases at this station in 1929, all Chinese.

The incidence of meningitis among the steerage passengers on vessels arriving at San Francisco from the Orient is as follows: 1925, 0; 1926, 1; 1927, 2; 1928, 1; 1929, 14. A further consideration of vessels having had or having meningitis among their personnel in 1929 seems warranted in order to show any relation that might exist between that infection and the occurrence of cases on the Pacific Coast. The first ship in this category arrived on October 3, 1928, and from that date to May 29, 1929, there were 14 vessels with a total of 126 cases of meningitis. Space will not permit of an analysis of these cases, but as the vessel that arrived on March 20, 1929, furnishes an excellent example of the effects of overcrowding and failure to isolate cases promptly, further consideration of it is justifiable.

There were reported 21 cases of meningitis with 4 deaths en route, all Filipinos, except 1 white seaman. Upon arrival there were 13 cases in the ship's hospital and during inspection at quarantine 6 additional cases were found. There were 27 cases among 581 Filipinos from Manila, but none among 171 Chinese from Hong Kong. The first cases occurred on the 10th day from Manila, and the others as follows: March 3, 1; March 8, 1; March 9, 2; March 11, 1; March 14, 6; March 15, 2; March 17, 4; March 18, 2; March 19, 2; March 20, 6. The last were detected at quarantine inspection. This vessel was crowded with steerage passengers; there were 647 when leaving Manila; 708 when leaving Hong Kong, and 448 upon arrival at San Francisco. During 10 days' detention of passengers at the Quarantine Station 11 cases of meningitis developed and 2 among them after discharge, a total of 40. Advices state that 20 cases developed among the Filipinos landed and detained at Honolulu, making approximately 60 cases among the 647 Filipino steerage passengers brought by this vessel.

Two other vessels arrived with high incidence of infection; one had 27 cases: 22 Filipinos and 5 Chinese; the other, 25 cases with 12 deaths: 21 Filipinos and 4 Chinese. Twenty-two of these occurred in adjoining compartments.

After May 29, 1929, no other vessels arrived having had menin-

gitis until December of that year. Chargeable against 1930 there have been only 4 vessels with a total of 8 cases of meningitis: 3 arrivals at San Francisco and 1 at Seattle.

SUMMARY OF REPORTED CASES OF EPIDEMIC MENINGITIS AMONG STEERAGE PASSENGERS ON VESSELS ARRIVING AT SAN FRANCISCO FROM OCT. 3, 1928, TO MAY, 1929

Race	*Cases*	*Deaths*
Filipinos	99	19
Chinese	22	9
Japanese	1	0
White	4	2
Total	126	30

The number of deaths may not be accurate, and is probably nearer 50 per cent.

The 126 cases occurred on 14 vessels, and if we assume that each carried an average number of 600 steerage passengers, we have this large number of cases in an approximate population of 8,400. When comparison is made with San Francisco, the effects of crowding and contact infection are astounding. For example, there were 73 cases in San Francisco, in a population of 625,000, during the period that 126 cases occurred on vessels with an approximate population of 8,400.

DISCUSSION

The history of meningitis on some vessels indicated Manila was the source of infection, and in others Hong Kong. The infection was introduced by embarkation of carriers or mild cases, and secondary cases developed from contact. Under conditions existing in the steerage, which was crowded, with free communication between compartments, it is no surprise that meningitis spread. The steerage passengers were bunked in close apposition to each other and there was every opportunity for the exchange of nose and throat infections. Under these conditions, meningitis has proved a dangerous contagious disease.

Cultures from 3,287 contacts gave 85 carriers. Ninety per cent of the carriers became negative in 7 days, and all in 14 days except 1 who was positive for 6 weeks.

During detention in quarantine there developed 11 cases and 2 after 10 days' detention.

RELATION OF MENINGITIS ON VESSELS TO THE INCIDENCE OF THE DISEASE IN PACIFIC COAST STATES

I believe that the high incidence of meningitis in the Pacific Coast and adjoining states was independent of the prevalence of the disease in the Orient and the infection on arriving vessels. It was a cumula-

tive effect from preceding years, as occurs in the cyclical development of outbreaks of meningitis. In various parts of the United States and other countries 1929 was a meningitis year.

It has been shown that Filipinos played no part in serious outbreaks in 2 adjoining states. No case was reported among the Filipinos in San Francisco during 1928, and it was not until February, 1929, that cases of meningitis commenced to appear among them.

Although the arrivals of Filipinos and Chinese from infected ports and on ships with the disease on board cannot be held responsible for the outbreak of meningitis in Pacific Coast states, such arrivals in large numbers might have been a contributing factor in adding to the number of cases in specific areas where they concentrated. The Filipino appears susceptible to the disease and no doubt some carriers were landed before the quarantine regulations were enforced, and probably after. These people crowd together in boarding houses or small flats for economic reasons, and consequently favorable conditions are created for the development of the disease among them.

Fifty Years of Applied Bacteriology

APPROXIMATELY half a century ago medical science enjoyed an unparalleled advance as a result of the introduction of practical laboratory methods in the study of bacteria. There are still with us a few of the pioneers of that remarkable era, notably our dearly beloved Welch. But for the medical profession at large the epoch-making work of the late 70's and early 80's is fast becoming a matter of history.

Impressed by the importance of preserving what concrete relics of this interesting period can still be rescued from obscurity, the writer suggests the advisability of organizing an exhibit to commemorate "Fifty Years of Applied Bacteriology," collecting for this purpose whatever interesting historical material may be hidden away, dust covered and forgotten, in some of the older bacteriological laboratories. Apparatus long since discarded as obsolete, old microscopes, microtomes, glass plates and levelling stands, roll cultures, illustrations of alleged disease germs, old text books, original publications of historic interest, reproductions of early culture flasks, these and many other articles may still be available. Fifty years hence much of this valuable historical material will have been lost forever.

What group interested in the history of medicine will act on this suggestion before it is too late?—C. F. B., *Weekly Bull.*, New York, N. Y., Dec. 27, 1930.

White House Conference on Child Health and Protection

Preliminary Program of

Final Session

SECTION I—MEDICAL SERVICE

February 19, 20, 21, 1931

Washington, D. C.

Samuel Mc C. Hamill, M.D., Chairman

Committee A—Growth and Development, Kenneth D. Blackfan, M.D., Chairman, Professor of Pediatrics, Harvard University Medical School.

Committee B—Prenatal and Maternal Care, Fred Lyman Adair, M.D., Chairman, Professor of Obstetrics and Gynecology, University of Chicago.

Committee C—Medical Care for Children, Philip Van Ingen, M.D., Chairman, Clinical Professor, Diseases of Children, Columbia University College of Physicians and Surgeons.

Thursday, February 19, 1931

9:00 A.M. Opening Session for All Committees

Address of Welcome—Ray Lyman Wilbur, M.D., Chairman of the Conference

Committee A—Growth and Development

Thursday

9:30–11:00 A.M.

General Considerations—Edwin Bidwell Wilson, Ph.D., Professor of Vital Statistics, Harvard School of Public Health

Thursday

11:00 A.M.–1:00 P.M.

Anatomical Considerations—Richard E. Scammon, Ph.D., Professor of Anatomy, University of Chicago

Thursday

2:30–4:30 P.M.

Physiological Considerations—A. J. Carlson, M.D., Sc.D., Professor of Physiology, University of Chicago

Thursday

8:00 P.M. (See Program of Committee C—Medical Care for Children)

Friday, February 20, 1931

9:30 A.M. (See Program of Committee B—Prenatal and Maternal Care)
(See Program of Committee C—Medical Care for Children)

Friday

2:00–3:30 P.M.

Appraisal of the Child

1. Physical Status—T. Wingate Todd, M.B., F.R.C.S., Professor of Anatomy, Western Reserve University School of Medicine

Friday
3:30–5:00 P.M.
Appraisal of the Child
2. Mental Status—Douglas A. Thom, M.D., Director, Division for Mental Hygiene, Massachusetts Department of Mental Diseases

Friday
8:00 P.M.
Nutrition—Lafayette B. Mendel, Ph.D., Sc.D., Professor of Physiological Chemistry, Yale University

Committee B—Prenatal and Maternal Care

Thursday, February 19, 1931
9:30–11:30 A.M.
Prenatal, Maternal and Early Infant Care—John Osborn Polak, M.D., Professor of Obstetrics and Gynecology, Long Island College Hospital School of Medicine

Thursday
11:30 A.M.–12:30 P.M.
Interested Organizations—Robert D. Mussey, M.D., Professor of Obstetrics University of Minnesota (Mayo Foundation)

Thursday
2:00–5:30 P.M.
Factors and Causes of Fetal, Early Infant and Maternal Morbidity and Mortality—Hugo Ehrenfest, M.D., Assistant Professor of Obstetrics and Gynecology, Washington University Medical School

Thursday
8:00 P.M. (See Program of Committee C—Medical Care for Children)

Friday, February 20, 1931
9:00–10:15 A.M.
Obstetric Teaching and Education of Midwives—James Robert McCord, M.D., Professor of Obstetrics and Gynecology, Emory University

Friday
10:15–11:30 A.M.
Obstetric Teaching and Education of Nurses and Nursing Attendants—George W. Kosmak, M.D., Editor, American Journal of Obstetrics and Gynecology

Friday
11:30 A.M.–12:30 P.M.
Teaching and Education of the Laity and Social Workers—Robert L. DeNormandie, M.D., Instructor in Obstetrics, Harvard University Medical School

Friday
9:00 A.M.–12:30 P.M.
Basic Sciences and Their Relation to Maternal and Fetal Problems—Leslie B. Arey, Ph.D.

Friday
2:00–5:30 P.M.
Obstetric Teaching and Education of Physicians
1. Correlation of Instruction in the Basic Sciences with that in Obstetrics from:

a. Viewpoint of Basic Sciences—Leslie B. Arey, Ph.D., Professor of Anatomy, Northwestern University Medical School

b. Viewpoint of Obstetrics—J. M. H. Rowland, M.D., Professor of Obstetrics, University of Maryland School of Medicine

2. Undergraduate Education—Palmer Findley, M.D., President Central Association of Obstetrics and Gynecology

3. Graduate Education—Rudolph W. Holmes, M.D., Associate Professor of Obstetrics, Northwestern University Medical School

4. Education and other Obstetric Requirements for Granting Degree of Doctor of Medicine, Licensing to Practice, and for Specialization—Walter T. Dannreuther, M.D., Professor of Gynecology, New York Post-Graduate Medical School

Friday
8:00 P.M. (See Program of Committee A—Growth and Development)

Committee C—Medical Care for Children

Thursday, February 19, 1931
9:30 A.M.–1:00 P.M.

Convalescent Care—Adrian V. S. Lambert, M.D., Chairman, Executive Committee on Convalescence, Welfare Council of New York, N. Y.

Foster Homes for Convalescence—Ida M. Cannon, R.N., Chief of Social Service, Massachusetts General Hospital

Thursday
9:30 A.M.–1:00 P.M.

Psychiatry and Psychology—Bronson Crothers, M.D., Assistant Professor of Pediatrics, Harvard University Medical School, Neurologist to Children's Hospital, Boston, Mass.

Thursday
9:30 A.M.–1:00 P.M.

Orthopedics and Body Mechanics—Robert Bayley Osgood, M.D., Professor of Orthopedic Surgery, Harvard University Medical School

Thursday
9:30 A.M.–1:00 P.M.

Nursing—Stella Goostray, R.N., Secretary, National League of Nursing Education, Superintendent, School of Nursing, Children's Hospital, Boston

Thursday
2:30–5:00 P.M.

Hospitals and Dispensaries—Clifford G. Grulee, M.D., Clinical Professor of Pediatrics, Rush Medical College (Lantern Slides)

Thursday
8:00 P.M.

Preventive Measures—Philip Van Ingen, M.D., Chairman of the Committee

Report on a National Survey to Determine the Extent to which Preventive Medical and Dental Services Reach Preschool Children—George T. Palmer, Dr.P.H., Director of Research, American Child Health Association (Lantern Slides)

1. In 158 cities based upon approximately 85,000 families interviewed. Relative standing of states in proportion of preschool children having had health examinations, dental health examinations, vaccination against smallpox and diphtheria immunization. Influence of economic status and age.

2. In rural areas in 42 states based upon approximately 25,000 families interviewed. Relative standing of states in proportion of preschool children reached. Variations at different age levels. Geographic differences in hospital and home delivery service and attendance at birth. Accessibility of medical, dental and hospital service.

Conclusions and Recommendations—Samuel McC. Hamill, M.D., Chairman of the Section

Friday, February 20, 1931
9:30 A.M.–12:30 P.M.
Pediatric Education—Borden S. Veeder, M.D., Professor of Clinical Pediatrics, Washington University School of Medicine (Lantern Slides)

Friday
2:15–5:00 P.M.
Medical Social Service—Ida M. Cannon, R.N., Chief of Social Service, Massachusetts General Hospital

Friday
2:15–5:00 P.M.
Health Centers—J. H. Mason Knox, Jr., M.D., Chief, Bureau of Child Hygiene, State of Maryland Department of Health; and Mrs. Berthold Strauss, Vice-President, Community Health Center, Philadelphia, Pa.
Relation of the Nutritionist to the Health Program—Lucy H. Gillett, M.A., Superintendent, Nutrition Bureau Association for Improving the Condition of the Poor

Friday
2:15–5:00 P.M.
Dentistry and Oral Hygiene—Percy R. Howe, D.D.S., D.Sc.

Friday
8:00 P.M. (See Program of Committee A—Growth and Development)

Saturday, February 21, 1931
9:30 A.M. Joint Session for All Committees

Summaries of Findings and Recommendations of the Committees

1. Committee A—Growth and Development—Kenneth D. Blackfan, M.D., Chairman of the Committee
2. Committee B—Prenatal and Maternal Care—Fred Lyman Adair, M.D., Chairman of the Committee
3. Committee C—Medical Care for Children—Philip Van Ingen, M.D., Chairman of the Committee

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The Discovery of Trichina Spiralis

THE recent outbreak of trichinosis in Stuttgart has kindled interest in a disease epidemics of which are uncommon in this country. The story of the discovery of the parasite [1] is obscured by priority claims which lack historical perspective. Even the new edition of Osler's *Principles and Practice*—a textbook famed for its historical atmosphere—gives a regrettably incomplete account of the history of trichinosis, with no mention of Paget's name.

The main events in the story may briefly be summarized. F. Tiedemann in 1822 was the first to describe "white stony concretions" in human muscle (analyzed by L. Gmelin), though he never suspected their parasitic origin. In 1833 John Hilton described minute cysticerci in which microscopically he was unable to detect any organization. On February 2, 1835, at St. Bartholomew's Hospital, James Paget was dissecting the muscles of a subject when his scalpel became quickly and repeatedly blunt. Other students had attributed their similar experience to the presence in the muscles of "spicula of bone," and Wormald, the senior demonstrator of anatomy, had seen at least 20 bodies studded with whitish specks. Paget, however, was the first to suspect their animal nature, which he confirmed with the aid of Robert Browne's simple microscope—for St. Bartholomew's did not even possess a dissecting lens. He made careful sketches of the worm, preserved in the library of the Royal College of Surgeons of England, and lectured on his discovery to the Abernethian Society of St. Bartholomew's Hospital, on February 6. On Stanley's suggestion he wrote an account of his work for the *London Medical Gazette*. This was never published, but the manuscript may be seen at the College of Surgeons.

A specimen of infected muscle was sent to Richard Owen, who established the nematoid nature of the worm, named it *Trichina spiralis*, and, taking the credit for its discovery, earned the applause of his professional brethren. Paget's behavior in this melancholy episode was admirable. His original specimen was deposited in St. Bartholomew's Hospital museum. Fifty years later it was thrown away, as time had reduced it to dust and ashes.

The life history of the trichina was fully worked out by Herbst, Virchow, Zenker, and Kuhne, who completed a discovery made by a medical student of twenty-one years.—*Brit. M. J.*, Oct. 11, 1930, p. 610.

This statement omits entirely any reference to the most significant discovery among those of the many investigators who contributed to working out the life history. It was the demonstration of a similar encysted stage in the pig. For this the distinguished American physician and investigator Dr. Joseph Leidy of Philadelphia was responsible. The older authors overlooked the leading part he played in laying the foundations of parasitology, perhaps by virtue of his outstanding contributions in other fields. This oversight was adequately corrected by numerous addresses delivered on the occasion of the Leidy centenary in Philadelphia during September, 1923.

Leidy's part in the elucidation of the life history of trichina was one of the most significant contributions to research, giving the key to unlock the story of the life cycle of this parasite and at the same time furnishing the foundation for a simple and effective method for the prevention of the disease.

In 1846 Leidy recorded the discovery of minute encysted worms in the hog. He wrote that he "could perceive no distinction between it and specimens of *Trichina spiralis* which he had met with in several human subjects."[2]

REFERENCE

1. Fully told in *St. Bartholomew's Hosp. J.*, XXXVI: 39–42, 1928.
2. *J. A. M. A.*, Dec. 27, 1930, p. 1988.

EDITORIAL SECTION

Expressions of opinion and statements of supposed facts are published on authority of the writer under whose name they appear, and are not to be regarded as expressing the views of the American Public Health Association, unless such statements or opinions have been adopted by vote of the Association.

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CONTROL OF MENINGOCOCCUS MENINGITIS

THE incidence of meningococcus meningitis has been rising steadily through the last five years[1] and has been accompanied by local epidemics of some severity and with high fatality rates. The number of carriers has also been higher than in former reports. Flack[2] found 2 per cent of the community and 8 per cent of the contacts to be carriers, whereas in a recent epidemic in Detroit 6 per cent of unexposed members of the community and 46 per cent of contacts were found to be carriers. Segregation of carriers is usually considered impracticable.[3] When untreated the carrier stage has been found to persist on the average for 4½ weeks in contact carriers, and for 3½ weeks in carriers who are not known to have been contacts.[3]

Thirteen years ago Simon Flexner[4] emphasized the importance of treating carriers as a potential source of future cases and recommended the method of Dunham and Dakin[5]—the use of an oil spray of dichloramine T. He stated that artificial immunization through inoculation of killed cultures "has failed completely."

Since that time no constructive suggestions of serious importance have been offered, although the subject has been frequently discussed. The revival of the method of inoculation with apparent success is therefore worthy of some attention.

In the winter of 1927, Dr. Manoussakis found himself confronted with an epidemic in the cavalry barracks at Athens.[6] Of 150 contacts 70 per cent were found to be carriers. He prepared a vaccine by cul-

ture from the puncture fluid of the original case. The vaccine was killed by heat at 56° C. for 30 minutes and administered in 2 doses of 2 and 3 milliards respectively at an interval of 7 days. The number of carriers among the contacts was quite promptly reduced to 2 per cent and the threatened epidemic was averted.

The same method was used during 2 threatened epidemics in the winter of 1929 and in one instance during the present year (1930). In discussing his apparent success on each of these occasions Dr. Manoussakis emphasizes: (1) that the vaccine was freshly prepared, and (2) that the strain employed was absolutely specific. In view of the known variety of strains and of the recent recognition[7] of an organism hitherto undescribed, the latter point is evidently significant.

REFERENCES

1. Williams, R. C. The Prevalence and Trend of Meningococcus Meningitis in the United States, *Pub. Health Rep.*, 45: 1657 (July 18), 1930.
2. Flack, M. Med. Research Council. *Spec. Rep. Ser. No. 3*, 1917.
3. e.g., Mink. *Epidemiology and Public Health*, 1: 577, 1922.
4. Flexner, Simon. Mode of Infection, Means of Prevention, and Specific Treatment of Meningitis, *J. A. M. A.*, 69: 639, 721 (Aug. 25, Sept. 1), 1917.
5. *Brit. M. J.*, 1: 682, 1917.
6. Manoussakis, M. E. L'Autovaccination antiméningococcique en période épidémique, *Bull. Acad. de Méd., Paris*, 104: 155 (Aug. 4), 1930.
7. Branham, Sara E. *Pub. Health Rep.*, Apr. 18, 1930.

MR. CALVER RESIGNS AS EXECUTIVE SECRETARY

HOMER N. CALVER resigned on December 31 as Executive Secretary of the American Public Health Association, after seven and one-half years' service. This announcement will be received by all the friends of the Association with regret.

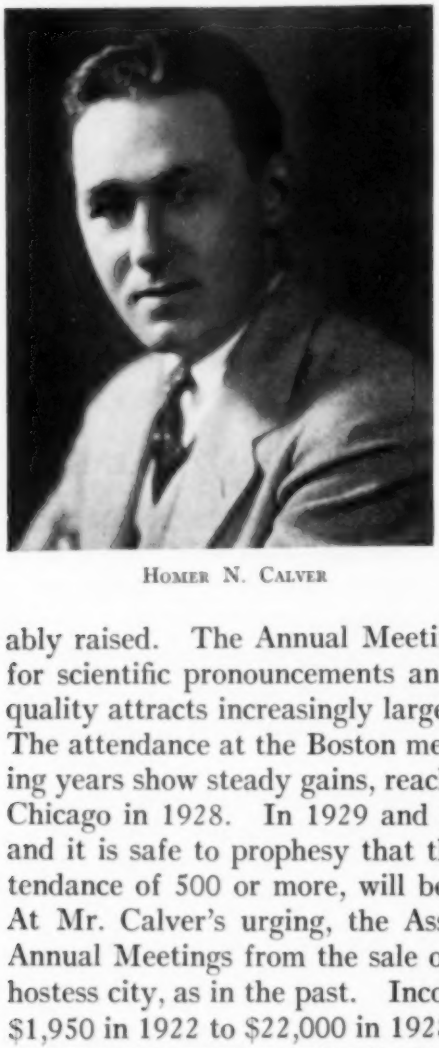
The Executive Board accepted Mr. Calver's resignation with reluctance upon his request for release from his obligations, and in so doing, spread the following resolution on its minutes in behalf of the Association:

> RESOLVED, that during the term of his office, Homer N. Calver as Executive Secretary of the American Public Health Association has put the interests of the Association before all others, has been loyal to his responsibilities, energetic and resourceful in carrying out the intent and directions of the officers and members, patient and equable in the presence of conflicting opinion, and counsel, systematic and thorough in making effective the changes in plan and scope of the work and organization of the Association, twice radically altered during his term of office, scrupulously careful in all matters of income and expenditures of the Association, and at all times consistently upholding high professional standards for the public health profession in dealing with commercial and business interests in the conduct of his office.

Every member of the Association and every reader of its *Journal*, no matter how casual his observation of the affairs of the Association

may have been, cannot fail to be struck with the growth and development of the organization during Mr. Calver's competent administration. Some comparisons between situations in July, 1923, when Mr. Calver took office, and now, may be interesting.

When he took office, the Association had about 2,600 members. It now has 4,300 members, not including an additional 2,500 members in the affiliated state societies. The number of these societies has grown from 3 to 15. The relationships of the societies to the parent organization have been clarified and strengthened.



HOMER N. CALVER

To the Annual Meetings of the Association Mr. Calver has made a contribution that cannot be overestimated. He has devoted himself with great zeal to their organization and has developed a most efficient technic for their management and operation. Through his efforts and vision, excellent programs have been built up, the range of subject matter has become infinitely wider, and the standards of papers noticeably raised. The Annual Meetings have become distinguished alike for scientific pronouncements and attendance. This definite rise in quality attracts increasingly large audiences of Fellows and members. The attendance at the Boston meeting in 1923 was 904. The following years show steady gains, reaching the high-water mark of 2,577 in Chicago in 1928. In 1929 and 1930 registrations were about 1,400 and it is safe to prophesy that this figure, representing a gain in attendance of 500 or more, will be reached for several years to come. At Mr. Calver's urging, the Association has determined to finance Annual Meetings from the sale of exhibit space instead of taxing the hostess city, as in the past. Income from exhibits has increased from $1,950 in 1922 to $22,000 in 1928 and to $17,500 in 1929.

The place of the sanitarian in public health has been memorialized through the establishment of the Sedgwick Memorial Medal, which has been to a considerable extent brought about through the efforts of Mr. Calver.

The *American Journal of Public Health,* of which Mr. Calver was

editor for five years, and the supervision of which has been his responsibility throughout, has increased its circulation from some 3,700 copies per month to over 6,500 copies. Recently the purchase of *Nation's Health* was negotiated and it was combined with the *Journal* so that the publication now stands alone in this field.

The excess of all assets of the Association over liabilities at the time when Mr. Calver assumed direction of the Association was about $3,500. With careful husbanding this has grown to a net wealth of nearly $28,000. For the fiscal year 1923, the income from all sources except grants for special purposes was in the neighborhood of $40,000. This year the comparable income is $123,000. These figures are significant because this income, which must be earned largely through self-supporting activities, has increased without a corresponding increase in the dues of members. Although these figures may seem small in these days of million dollar enterprises, their importance in terms of progress of the Association are most significant. Of even greater value are the many constructive changes in administration which have been brought about, giving stability of organization and clarity of function to the increasingly numerous elements of the Association.

These activities, which are casually accepted and taken for granted by the members of the American Public Health Association, have attracted the attention of those who view general public health development, and as an indication of their significance in the field of public health promotion, the Ling Medal for distinguished service in behalf of health and child welfare was presented to Mr. Calver as Executive Secretary of the Association at the Fifty-ninth Annual Meeting in Fort Worth.

In seven and one-half years Mr. Calver has inscribed a record on the scrolls of the Association that will challenge his successor.

It is the sincere belief of those who have worked with Mr. Calver, and in doing so have had the opportunity to know his talents and his fitnesses, that he goes on to bigger and better things. He takes with him the good will and firm friendship of the members of the Association to which he has made such a splendid contribution.

BARBER SHOPS AND BARBERING

ALMOST everyone, male and female alike, now patronizes barbers. Even those women who frequent the beauty parlors go to barbers to have their hair trimmed.

In view of this, a report recently made by the Commissioner of

Public Health of Massachusetts[1] will be of interest to our readers. The Legislature of Massachusetts ordered an investigation of barbers and barbering, which was done partly through a questionnaire, to which 1,675 doctors responded. Only 16.3 per cent of the physicians had ever seen cases of diseases attributable to barber shops, but these reported 654 cases, 58 per cent of which were pustular skin infections, 35 per cent not classified, and 7 per cent described as nits, ringworm and syphilis. Thirty-four per cent of these cases were reported by 5 physicians, and the Commissioner has rightly questioned the diagnosis, at least as far as syphilis goes.

The newspapers took an interest in the investigation, and at their request, two public hearings were held at which 40 persons in a population of more than 4¼ million reported their conviction that they had been infected in barber shops; but of these, only 20 could be located, in 3 of which the claim seemed reasonable.

Inspection showed that of 2,439 shops in different sized communities, 34.5 per cent were in good condition, 18.4 per cent bad, while 46.6 per cent were mediocre. In general, the sanitary and esthetic conditions were proportionate to the prices charged by the shop.

The conclusions reached were that while there was room for improvement in the sanitary conditions of shops generally, only a negligible amount of skin infection could be traced to them, and there seemed to be no evidence indicating that further legislation regarding licensing, regulating, or inspecting of barber shops was needed at this time in Massachusetts.

The result of these studies, which have been carefully carried out, will be comforting to all who patronize barbers, assuming that Massachusetts represents fairly the rest of the country. The small number of skin infections reported, especially those due to lice and ringworm, is somewhat surprising. Certainly barbers come in contact with the great proportion of the population. In shaving, the external layers of the skin are frequently broken. Brushes and combs are used on hundreds of heads, often with imperfect or no washing or sterilization in between. The same shaving brush is used on many faces, but the necessities of the case require at least washing, which is generally done in hot water. The average barber is fond of blowing away the clipped hair, which furnishes abundant opportunity for droplet infection, and no barber discontinues his job on account of ordinary colds and sore throats. Like all places frequented by numbers of people, they afford opportunity for the spread of infection.

REFERENCE

1. *New England J. Med.*, Jan. 9, 1930, pp. 89–90.

ASSOCIATION NEWS

DR. WALKER ACTING EXECUTIVE SECRETARY OF THE A. P. H. A.

Due to the resignation of Homer N Calver, as of January 1, 1931, W. Frank Walker, Dr.P.H., Secretary of the Committee on Administrative Practice, will serve as Acting Executive Secretary of the Association.

NEW SECRETARY FOR THE COMMITTEE ON FELLOWSHIP AND MEMBERSHIP

Cornelia Lyne, who has been Secretary of the Committee for the past year, has resigned to take a position as head of the Membership Department of the National Child Labor Committee of New York City. Marie L. Rose, formerly of the American Child Health Association, will succeed her, beginning January 15.

LABORATORY SECTION

Beginning with this issue, John F. Norton, Ph.D., takes over the preparation of the Laboratory Notes Section of the Journal, succeeding C. C. Young, D.P.H., whose many duties have made it impossible for him to continue to contribute to this department.

ACKNOWLEDGMENT

The following members of the Association sent in paid applications for new members during the 4-weeks membership drive:

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Albert V. Hardy, Iowa City, Ia., Assoc. Professor, Dept. of Preventive Medicine, Iowa State Univ.
A. F. Richards, M.D., Sparta, Tenn., Associate Director, Local Organization

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DEATH OF DR. HASTINGS

CHARLES J. HASTINGS, M.D., Medical Officer of Health, Toronto, Ont., died on January 17. He has been a member of the American Public Health Association since 1911, a Fellow since 1922, and was elected to Honorary Fellowship in 1926. He was President of the Association in 1918.

PUBLIC HEALTH ADMINISTRATION

HENRY F. VAUGHAN, D. P. H.

Administrative Record Forms—The Committee on Administrative Practice has recently issued an Administrative Cumulative Monthly Record Form which is based upon the *Appraisal Form*, which aims to give each month a picture of the quantity of service rendered in each of the various activities into which the *Appraisal Form* has been divided. Thus, under communicable disease control there are entries for the number of field visits by professional personnel for each of the more important reportable diseases. The number of cases hospitalized, and the number of children or adults immunized against certain diseases may also be entered on the form. For tuberculosis, there is provision for a record of all new cases admitted to the clinic, the number of contacts examined, the number of visits made in behalf of cases by field nurses, and the number of cases hospitalized, together with several other items.

In the same manner, closely adhering to the outline of the *Appraisal Form*, provision is made for a brief statement of vital statistics, care of the child including the school health service, food and milk, sanitation, laboratory, and popular health instruction. There are also additional forms covering cancer and heart disease control. Provision is also made for a summary which affords a comparison over a period of 4 years. The tables permit of extension and may be fitted to local needs. These record cards have been designed to keep the health administrator intimately informed as to progress being made by his department during the course of the year, and the cumulative record is designed primarily as an aid in the preparation of the annual appraisal of health activities.

In 1927 the Committee on Administrative Practice issued its first record forms. There were four sets submitted at that time including forms for communicable disease service, laboratory, school health service, and public health nursing. In 1928, with the coöperation of the National Tuberculosis Association, tuberculosis record forms were developed, and in 1929, with the aid of the American Social Hygiene Association, forms were developed for venereal disease clinic service. The latest contribution of the committee may be had by addressing the Association headquarters.

Health Service in Alameda County—In the spring of 1930, a survey was conducted of Alameda County, Calif., by an officer of the U. S. Public Health Service, to determine the quantity and quality of health work being performed, special attention being given to those agents supported by public funds and devoting their effort to public health or the care of the ambulatory sick.

Alameda County, with a population of 440,200, is located on the eastern shore of San Francisco Bay, and 91.4 per cent of the population is classed as urban, the principal cities being Oakland, Berkeley, and Alameda. One dollar and six cents per capita is being spent for public health work. According to the *Appraisal Form*, Oakland receives a rating of 629 points, Berkeley 752, and Alameda 638 points.

It is recommended that there be created a county health department to be

under the direction of a trained medical health officer of demonstrated ability, on a full-time basis, and that the county health department have administrative control of all public health services, preventive clinics, and field activities in the area served by such county health department. It is further recommended that a beginning be made by an expenditure of $1.00 per capita for the included areas.—Joseph W. Mountin, Health and Hospital Services in Alameda County, Calif., Alameda County Tuberculosis Association, 1930.

Organized Health Service for Endicott Johnson Company—Beginning in 1916, with 1 full-time physician and 1 nurse, the Endicott Johnson Corporation of Binghamton, N. Y., has gradually extended its health and medical service until in 1928 nearly $900,000 a year was being expended for the maintenance of three medical centers with hospital service, first aid stations, and various clinics. There are now over 100 employees including 28 physicians, 4 dentists, 5 dental hygienists, 67 trained nurses, and 4 bacteriologists. In the year 1928, $161,000 was paid to full-time medical members of the staff, and $39,000 to private practitioners engaged on a fee basis. The cost per individual, to whom the service was potentially available, was $21.81 per annum, and the cost per individual in families which actually used the service was $25.49 per annum. A survey made to compare the degree to which medical service was being used by the employees of the organization as compared with 100 families in the general population of the neighboring communities shows that employees are not only visiting physicians more frequently, but earlier in the course of a given illness.—Niles Carpenter, Medical Care for Fifteen Thousand Workers and Their Families, *Publication No. 5,* Committee on Cost of Medical Care.

Milk-borne Outbreaks—Exclusive of New York City, it is estimated that about 80 per cent of the milk sold in the cities of New York State is pasteurized. From 1917 to 1929 inclusive, there have been 91 milk-borne outbreaks, an average of 7 yearly, with the total of 2,511 cases.

Typhoid fever has been responsible for 64, or 70 per cent, of the outbreaks, about 5 per cent of all reported cases of typhoid fever belonging to the milk-borne classification. At the same time, 16 per cent of all reported septic sore throat cases, 0.1 per cent of diphtheria, scarlet fever and poliomyelitis also were due to milk-borne outbreaks.

Of the 91 outbreaks, 89 were traced to raw milk, in 2 instances certified milk being involved. In only 2 instances is it alleged that pasteurized milk was involved, and in 1 instance involving 23 cases of typhoid fever, it is alleged that reinfection occurred after pasteurization. In the other instance involving 29 cases of scarlet fever, there is reason to believe that the milk was not actually pasteurized. Both outbreaks traced to certified milk occurred in one county. The first occurred in 1920 and included 70 cases of diphtheria, while the second occurred in 1924 and involved 60 cases of paratyphoid.—Paul B. Brooks, Milk-borne Outbreaks in New York State, *New York State J. Med.*, Dec. 1, 1930.

LABORATORY

JOHN F. NORTON, PH. D.

STUDIES OF CHEMICAL STERILIZATION AND BACTERIOSTASIS

I. A STANDARD INHIBITION CONTROL FOR GERMICIDAL TESTS

JUSTINA H. HILL

James Buchanan Brady Urological Institute, The Johns Hopkins Hospital, Baltimore, Md.

IN making bactericidal tests by any of the standard methods, or by modifications thereof, very careful inhibition controls must be made, in order to be sure that the apparent sterility of sub-cultures is not due to the presence of inhibitory amounts of the test drug, carried over in transfer. The omission of such controls from the earlier work is explicable on the basis that these tests were designed for the testing of phenols, most of which have a relatively low inhibitory action. When such tests, however, are used for the evaluation of many of the newer drugs, some of which have extremely high inhibitory action, the addition of accurate inhibition controls becomes imperative.

The following inhibition controls, which have been in use in this laboratory for some time, are proposed because they seem to parallel most closely the actual germicidal test.

A. The Drug Transfer—Let it be assumed, for example, that in the actual test the amount of drug employed is 5 c.c., the amount of inoculum 0.5 c.c. of a broth culture, the amount carried over to sub-culture one 4 mm. loopful of this drug-inoculum mixture, and that the amount of broth in the sub-culture is 10 c.c. Under these conditions, the following control should be made:

1. Mix 5 c.c. of the drug dilution to be tested with 0.5 c.c. of sterile broth, the latter corresponding to the amount of the inoculum in the actual test.
2. Transfer one 4 mm. loopful of this mixture to 10 c.c. of broth.

This gives in the sub-culture tube an exact parallel of the amount of drug which is carried over in the actual germicidal test.

B. The Inoculum—Some authors have contented themselves with inoculating their inhibition controls with a loopful of undiluted culture, and others have deemed it sufficient to inoculate their sterile sub-cultures from the actual germicidal tests, some 48 or more hours after the test. Such inoculations usually have been with undiluted cultures. Both of these methods are fallacious. Under the conditions cited above, the correct inoculation of the inhibition control should be made as follows:

1. Mix 5 c.c. of sterile water with 0.5 c.c. of the same tube of culture that is used in the germicidal test, and at the same time as the actual test.
2. Transfer one 4 mm. loopful of this mixture to 10 c.c. of broth in which has previously been placed one 4 mm. loopful of the drug-water mixture described under "A. The Drug Transfer."

This inoculum represents the maximum number of organisms that could

possibly be carried over to the sub-culture in the actual test. No inhibition controls which employ any larger number of organisms are valid. In fact, the point may well be made that it is not fair to use even this maximum number of possible organisms, as this method does not take into account the reduction of the maximum number by drug action in the actual test. By making culture dilution controls the exact point at which sub-cultures remain sterile, owing simply to the small number of bacteria present in the 5.5 c.c. of the test mixture, may be determined. It seems probable, however, that, without working with fractions of the maximum number of organisms, the controls outlined above are sufficiently refined.

It is obvious that this inhibition control may be expressed as a formula for use with any method.

Let D represent the number of c.c. of drug employed in the test.

Let B represent the amount of inoculum employed.

Let S represent the amount of the mixture of D plus B used for sub-culture.

Let T represent the number of c.c. of broth used for sub-culture.

The inhibition control then consists of the following steps:

1. Mix 1 D and an amount of sterile broth equal to 1 B.
2. Transfer the equivalent of 1 S of this mixture to 1 T.
3. Mix the equivalent in sterile water of 1 D with 1 B.
4. Transfer the equivalent of 1 S of this mixture to the 1 T previously used in the second step.

Such inhibition controls should be made with every dilution of drug employed and with every type of organism used. It is wise to run such controls in triplicate to allow for unavoidable experimental variation.

The author realizes that these controls must either be accepted by others as they stand or modified according to the consensus of opinion of other workers in this field. However, these or essentially similar inhibition controls must be included before germicidal tests can be considered valid. Certainly the importance of such inhibition controls cannot be too strongly emphasized.

SUMMARY

A method of making inhibition controls has been proposed by which valid germicidal tests may be made by any accepted method.

A MODIFICATION OF THE SEITZ 20 ML. FILTER

N. W. LARKUM, PH.D.

Michigan Department of Health, Lansing, Mich.

THE advantages of the Seitz filter over many other types have been presented at length by the writer.[1] In the hands of many workers, however, results were not always satisfactory owing to a tendency on the part of such filters to leak air around the edges of the filter pad. This, of course, resulted in contamination of the filtrate. Air leakage is entirely avoidable provided a tight seal can be assured. With the type of filter at present on the market, pressure on the disc is secured by screwing down a threaded cylinder having a diameter of 44 mm. The base has the same diameter. Both top and base have a knurled flange which is 2 mm. thick. It is very difficult to secure a grip on these filters sufficiently firm to give the pressure necessary for a

tight joint. Further, the thinness of the flange makes the operation at times rather hard on the hands. By increasing the width of the flange it is possible to secure a better grip. By increasing the diameter of the cylinder more leverage can be obtained. The combination of wider and thicker flanges makes possible the application of much more pressure and assures an adequate seal. We have made a number of these filters and have found that in addition to much greater ease in assembling there have been no air leaks in any of our tests even when the pressure was greatly increased over that we had previously been using. One of the chief objections to the Seitz filter was the inability to secure sterile filtrates due to this leakage. It is felt that with the modification this objection has now been met.

An illustration showing the old and the new types is appended to show the differences between the two.

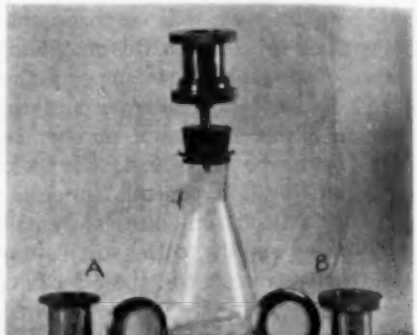

FIGURE I

A—old form. B—the modification.

REFERENCE

1. Larkum, N. W. A Comparison of Seitz and Mandler Filters. *A. J. P. H.*, 19, 6: 670 (June), 1929.

VITAL STATISTICS

LOUIS I. DUBLIN, PH. D.

Vital Statistics for Edinburgh, Scotland—One of the interesting facts disclosed by the annual report for 1929 is that for one year at least the population of Edinburgh has decreased. The present number is 427,538. This is 916 lower than it was in 1928. The present situation is accounted for largely by the birth rate, which was the lowest since 1918. At the same time the movement of population due to emigration has also been a contributing factor. Two hundred years ago the population was 40,000. The increase has been slow and steady. Expansion has been mainly due to extension of the city boundaries. The latest was in 1921 when the population rose from 314,193 to 420,264. While the total population has decreased, there were, in 1929, 1,379 more inhabited houses in the city than in 1928. This is due to new housing schemes and modern ideas of health. There is a tendency to move to more suburban areas.

Edinburgh's birth rate of 17.1 for 1929 is the lowest rate among the 8 largest towns in Scotland. At the same time, the death rate has increased to 15.1, the highest since 1922. The infant mortality rate is 80.—*Canad. M. A. J.*, 23: 854 (Dec.), 1930.

Vital Statistics for Vienna, Austria—The population for Vienna at the end of July, 1930, has been announced as 1,843,759, consisting of 850,733 males and 993,026 females. In July there were 260 fewer living births than in the previous month; only 296 of these births occurred in the home; the remaining 1,149 took place in institutions. The total number of deaths in July was 1,854 or 179 fewer than the previous month.

At the end of 1929, the population of Vienna was reported as 1,848,147, which is almost 30 per cent of the whole population of the republic. The total number of deaths for 1929 was 26,682, of which 1,044 were due to suicide and 75 to homicide. The chief cause of death was diseases of the heart and circulatory organs; cancer and neoplasms occupied second place and tuberculosis came third. Of the infectious diseases, diphtheria showed a high incidence; then came puerperal fever, typhoid, scarlet fever, measles and whooping cough. Not a case of Asiatic cholera, typhus or smallpox was reported in Vienna during 1928 and 1929. —*J. A. M. A.*, 95: 1985 (Dec. 27), 1930.

Diphtheria Immunity—Schick tests were made on 883 children in a small community, Rochester, Minn., with a population of about 20,000. The children ranged from 1 to 18 years of age. There were 411 of these children who had not been subjected to measures of diphtheria immunization and whose tonsils had not been removed. In this group there were 99 children under 6 years of age, 4 of whom showed negative reactions. Two of them had previously had diphtheria. Of the group from 6 to 18 years, 312 in number, 52 or 16.6 per cent gave negative reactions. In the group as a whole, 13.6 per cent of the Schick tests gave negative results.

In the second group were 96 children who had been tonsillectomized more than 6 months previously but had never been immunized against diphtheria. Nineteen were under 7 years of age and all gave positive results. Of the 77 between 7 and 18 years of age, 20 or 25.9 per cent gave negative reactions. In this group as a whole 20.8 per cent gave negative reactions.

In the third group were 24 children who had received toxin-antitoxin or toxoid and who had not had their tonsils removed. There were 32 under 5 years of age and all gave negative reactions. Of the 209 children between 5 and 18 years, 153 or 73.2 per cent gave negative reactions. The group as a whole showed 76.7 per cent negative reactions.

The last group was made up of 135 children who had received toxoid or toxin-antitoxin and whose tonsils had been removed more than 6 months previously. All of these children were between 5 and 18 years of age; 101 or 74.8 per cent of them gave negative reactions.

These results indicate that tonsillectomy had no effect on humoral immunity against diphtheria in this small community. The number of tests in this case was too small to allow accurate deductions, however. There have been only 30 cases of diphtheria in Rochester in the last 5 years; of these 7 cases were definitely imported and resulted in 3 secondary cases.—K. B. Geddie, Effect of Tonsillectomy and Adenoidectomy on Diphtheria Immunity. *Am. J. Dis. Child.*, 40: 1032–1034 (Nov.), 1930.

Pneumococcus Type I Pneumonia—A series of 3,662 cases of pneumococcus pneumonia in adults and 271 cases in children admitted to Bellevue Hospital for the past 10 years was studied clinically and bacteriologically. Of this series, there were 1,161 cases of type I infections and these form the basis for this investigation. The most

serious complications among the 1,131 adults were empyema, 73 or 6.5 per cent; meningitis, 20 or 1.8 per cent; and acute arthritis, 10 or 0.9 per cent. The common complications in the 30 children were empyema and otitis media, each of which occurred in 5 cases.

In the period from 1920 to 1929, in the series of 412 cases not given serum, there was a mortality of 28.2 per cent. The death rate for type I pneumonia in Bellevue Hospital has shown a steady rise since 1921. In the period from 1921 to 1929, the mortality rate increased from 20 per cent to 42.8 per cent. The mortality rate varied with the age of the patients; in children under 12 years old, it was 3.3 per cent; each decade the rate was higher and in patients over 50 it was 46.2 per cent. The mortality rate in patients with serious complications was very high; 29 cases of pneumococcus type I empyema showed a death rate of 51.7 per cent.

Huntoon's antibody solution was given to 171 cases of type I pneumonia for two years, 1920 to 1922. There was a death rate of 14 per cent; 171 control cases admitted during the same period showed a death rate of 21.1 per cent. In 56 cases admitted within 48 hours after onset, treatment with antibody solution resulted in a death rate of only 8.9 per cent, whereas 68 control cases showed a death rate of 23.5 per cent.

From 1924 to 1929, alternate cases of type I pneumonia were treated with Felton's concentrated antipneumococcus serum. There were 239 cases treated with a death rate of 20.1 per cent; 234 alternate controls showed a death rate of 31.2 per cent. In this 4-year period, the death rate of the treated cases varied from 17.7 to 22.9 and for the controls from 26.3 to 39.4 per cent. There was a further reduction in the death rate to 11.7 per cent in cases treated within 72 hours after onset as compared with a rate of 26.8 per cent for 97 controls. There were 48 deaths among the patients treated with Felton's serum but some morbid process other than pneumonia was a factor in nearly every case.—R. L. Cecil and N. Plummer, *J. A. M. A.*, 95: 1547–1553 (Nov. 22), 1930.

Tuberculous Infection in School Children—This study is based on 42,071 children examined and given the Pirquet tuberculin test during a period of 3 years. These are the results of the beginning of a 10-year program begun in Massachusetts in 1924 to find children who had the primary or juvenile form of tuberculosis. Since the study of the cases examined during the first 3 years' work in the clinics, 2 more years' work has been added. During the 5 years, there were 101,118 children given a tuberculin test and the positive reactors X-rayed. Twenty-eight per cent of the children gave positive reactions during this period.

Different sections in the same city showed a wide variation in the percentage of reactors. In one city of 60,000, the number of children in different school districts reacting to the tuberculin test varied from 11 per cent to 60 per cent. In the 3 junior high schools in this city, there were 22, 26 and 26 per cent reactors, respectively. In 8 schools, the children in the first six grades had a much higher percentage of reactors than the older children.

A study of children by the nativity of mothers showed no marked variation in the number of reactors when there was no history of contact. This study showed that approximately twice the number of children react to the tuberculin test when there is a history of exposure to pulmonary tuberculosis. The Teuton group showed 3 times as many reactors in the contacts. The Teuton non-contact group, 533 in number, showed only an average number

of reactors. The percentage of acknowledged contacts in each group ranged from 11 to 19 per cent. The highest percentage of contacts and the highest percentage of infections were shown for the Latin group.

Irish, Canadian and German boys showed a much higher incidence of infection than girls of the same nationalities. The reactors among the boys exceeded the girl reactors by more than 24 per cent in the Irish group, 50 per cent in the Canadian group and 52 per cent in the Teutons. In other nationalities, the percentage of reactors in the two sexes was approximately the same.

Comparing the results of the tuberculin survey made in 1917 by the Framingham Demonstration and the one made in the same city in 1926 by the State Clinic, a marked reduction in tuberculous infection after 9 years of intensive antituberculosis work was shown. The children in the 1926 group averaged 5.7 years older than those examined in 1917 but the percentage of reactors was 8.5 per cent less. The numbers considered in this comparison are small, but the marked reduction in infection checks up with the reduced death rate in Massachusetts for all forms of tuberculosis, which declined from 144 per 100,000 in 1917 to 73 in 1927.—H. D. Chadwick and D. Zacks, The Incidence of Tuberculous Infection in School Children, *Tubercle*, 12: 111–118 (Dec.), 1930.

The Future of the Diabetic Child—A series of 625 diabetic children treated from 1898 to 1930 formed the basis for this study. Of these children, 212 are dead and 413 living. The series contains many patients in whom a variety of methods of treatment has been employed. In order to compare the data fairly, the living children were divided into two groups, 81 children treated before the use of insulin was begun and 332 treated subsequently.

The skin of some of the children of both groups has shown xanthosis. Xanthoma diabeticorum has proved a rare complication, being recognized in only 3 cases. Tuberculosis or tuberculous lesions have occurred in 10 of the total 625 children, in 7 whose diabetes began before 1922 and in 3 whose onset was after that date. Only one child has cataracts. However, 3 of the fatal children who had never had insulin had cataracts.

Calcification of the blood vessels of the legs has occurred in 11 diabetic children, all of whom had onset of diabetes before 1922. The average duration of diabetes at discovery of sclerosis was 7 years. In 5 of these children the cholesterol of the blood was examined prior to the appearance of sclerosis; in 2 the cholesterol was above 230 mg.; in 3 it was persistently below. The average proportion of cholesterol in the group was 212 mg. per 100 c.c.

The children in this group with the longest duration of treatment are children treated by Dr. Joslin in the Allen era with few calories and relatively low quantities of carbohydrate. These children gained tolerance for carbohydrate. This treatment kept alive 50 diabetic children whereas children treated by other methods died. Insulin has been used 7 years by 59 diabetic children in this group. None of these have shown evidence of sclerosis whereas 3 of the pre-insulin children studied had evidence of calcification of the vessels of the legs.

The diabetic child has taught lessons of great importance: first, that heredity is an undoubted etiologic factor in diabetes; second, that the child affords new evidence to the theory that overnutrition is a precursor of diabetes; and third, that cataracts and arteriosclerosis can occur in pure diabetes under the age of 20 years.—P. White, *J. A. M. A.*, 95: 1161–1162 (Oct. 18), 1930.

PUBLIC HEALTH ENGINEERING

ARTHUR P. MILLER, C. E.

EPIDEMIC OF INTESTINAL DISORDERS IN CHARLESTON, W. VA., OCCURRING SIMULTANEOUSLY WITH UNPRECEDENTED WATER SUPPLY CONDITIONS

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THE great drought of 1930 caused public water supply conditions in Charleston, W. Va., from August to December, 1930, which probably have never been duplicated in a public drinking water supply for intensity of pollution. A widespread epidemic of intestinal disorders similar to those caused by mild food infection or a strong cathartic occurred in the city during the latter part of October and early November in which it was estimated that between 8,000 and 10,000 persons in Charleston were affected.

Throughout the entire period of 4 months—August to December, 1930—in which the acute and offensive taste and odor conditions existed in the water supply and a high pollution thereof continued due to a river reversing its flow, the filtration plant operation was above reproach, and daily independent bacteriological tests by three different water testing laboratories showed that the U. S. Treasury Standards for a bacteriologically safe drinking water had been met.

Charleston is furnished its public water supply of approximately 7 m.g.d. by a private water company, the source being the Elk River. This river with a 1,550 sq. mi. drainage area and a normal flow of 100 to 500 m.g.d. joins the canalized and navigable Kanawha River 1¼ miles below the water supply intake. Previous low water flow in the Elk over a period of 50 years was 19 sec. ft. Below the water intake are many sewers and a garbage incinerator which, due to laxity on the city's part during 1929 and until July 24, 1930, was discharging weekly 200 tons of household garbage and wholesale produce to the river. The State Water Commission, which has authority over stream pollution, ordered this grossly insanitary practice of discharging garbage into the stream stopped on July 24, 1930, and the city complied immediately.

Early in August the Elk River flow fell below the city's needs to the extent of 2 or 3 m.g.d., and then the Kanawha River, carrying the excessively high organic content from garbage putrefaction, with practically zero dissolved oxygen, and so polluted with sewage as to give a bacteria count of 50,000 to 100,000 per c.c. and *B. Coli* in 1/1,000 c.c., flowed upstream to the water intake. A heavy growth of algae developed in this filthy pool into which only a few million gallons of fresh water entered daily and a woody, mouldy, disagreeable taste developed with which strenuous water purification methods could not cope.

The following purification measures,

in addition to the regular sedimentation, filtration and final chlorination processes, were tried: prechlorination to reduce the heavy pollution load, using copper sulphate in the river basin to kill algae; aeration to attempt to replace the dissolved oxygen; and activated carbon fed into the inlet to the sedimentation basin to absorb the disagreeable flavors. Permanganate, ammonia, super-chlorination and dechlorination treatments also were tried in an effort to get rid of tastes and odors. All these measures were ineffective in removing entirely the taste and odor which came and went in varying intensity.

The prechlorination dosage finally reached a peak of 20 lbs. per m.g. The daily operation throughout August, September, October and November was under the watchful eyes of capable sanitary engineers. Every effort was made to see that no unsafe water passed into the city mains. Bacteriological tests indicate that, measured by the present accepted U. S. Treasury Standards for bacteria content, the water was safe.

Microscopical tests during August and September revealed abundant growths of blue-green algae of several different types capable of causing the objectionable odor. Cycles of algae growth were followed by development of crustacea, daphnia and other allied water flea organisms being present in such great numbers that a glassful of the raw river water appeared to be actively vibrating from the infinite number of organisms present.

So intense and disagreeable was the taste, particularly in the latter part of October and in early November, that, naturally, the general public refused to use the water for drinking purposes.

The State Health Department, relying upon the standardized bacteriological tests as a criterion for safe water, urged the general public to use the purified public supply rather than that from unknown wells and springs, or bottled waters which were being widely dispensed throughout the city for beverage purposes. The concentration of bacterial pollution of the lower Elk River pool, made up of both Kanawha River and Elk River waters, increased proportionally as the weeks went on because the Elk River practically dried up. Prechlorination had become the normal operation now in order to put out a safe water, a residual chlorine being held throughout the sedimentation basin, the filters and clear well.

Whether the intestinal disorders in the city during the latter part of October and in early November can be attributed to the water is still a mystery; but it is a fact that widespread disorders were noted wherever the water supply mains went. After careful epidemiological studies had been made by state and federal public health agencies, it was recommended that the intake be moved to the Kanawha River to a less sewage polluted zone. The water company is now spending $100,000 to install such an emergency intake.

On November 10 Dr. W. T. Henshaw, Commissioner of the State Department of Health, following a report to him by Dr. David Littlejohn, his epidemiologist, and E. S. Tisdale, state sanitary engineer, that several thousand cases of an acute intestinal ailment existed in Charleston, communicated with Surgeon General Hugh S. Cumming of the U. S. Public Health Service, stating the unusual conditions and asking assistance to determine if possible the real cause of the trouble. The Service immediately complied and Surgeon M. V. Veldee and Sanitary Engineer R. E. Tarbett arrived in Charleston on Armistice Day. They spent 3 days reviewing carefully the findings of the State Health Department, going over the bacteriological records, and making independent epidemiological studies. Their report describes the type of ailment from which Charleston people suffered:

A house-to-house canvas of a fair group of families living in two widely separated sections of the city reveals that from 10 to 15 per cent of the population was ill during the first week of November with an acute gastrointestinal ailment. This illness was characterized by a sudden onset, pain in the region of the stomach, usually nausea or vomiting or both, and followed by diarrhea of varying severity. Those ill had essentially no fever and the illness was very largely confined to persons over 10 years of age. The duration of illness varied with severity—usually from less than 1 day to upwards of 4 days.

In addition an interview was had with a representative group of the local physicians. The symptoms observed by them among their patients correspond with those recorded above.

The character of the onset and the ensuing symptoms do not suggest a disease caused by a bacterial infection but rather a poisoning by some substance which acts as a gastrointestinal irritant. In fact, the symptoms are similar to those produced by a strong cathartic.

In the case of the local source of water supply, the quiescent condition of the pool has allowed anaerobic decomposition (fermentation in the absence of oxygen) to take place in the accumulated sludge, with the absorption of the products of decomposition by the overlying water to an extent not possible in a flowing stream. It is entirely possible that such products might not be removed by the known processes of water purification.

In so far as we are aware the circumstances surrounding the public water supply of Charleston at the present time are entirely unprecedented in this country. In view of this fact we do not feel that the occurrence of an outbreak such as has taken place in Charleston within the past few weeks could have been reasonably predicted, particularly since the bacteriological records continued to indicate a drinking water of safe quality.

DEDUCTIONS FROM UNUSUAL CONDITIONS AT CHARLESTON, W. VA.

It is of note that the Charleston malady affecting several thousand people was experienced during unusual drought conditions. Actual septic conditions similar to those found in a septic tank prevailed in Elk River near the water works intake due to decomposing garbage, and sludge from the sedimentation basin, lying on the river bottom. Violent ebullition of bubbles took place when this river bottom sludge was disturbed. River traffic—stern wheel paddle-boat variety—was quite active in this stretch of river.

Whether products of anaerobic decomposition of nitrogenous or carbonaceous matter could be sufficiently concentrated in the water to produce a condition simulating food poisoning in those drinking the water has not been shown. Laboratory tests did show that the odoriferous compounds were quite readily removed by boiling and there appeared to be a large amount of oily substances in the water.

It is of interest to note that *Public Health Reports* of November 21, 1930, give an account of R. R. Spencer's studies of a persistent type of mild dysentery-like epidemic occurring in the national parks during the drought months of the year. His description of the malady (short duration, nausea, sharp pain in abdomen and diarrhea) is similar to the trouble which occurred in Charleston when drought conditions were at their height.

Neither the U. S. Public Health Service nor the State Health Department has stated definitely that the bacteriologically safe water supply was responsible for the epidemic, but it is certain that most unusual conditions have existed with reference to intensity of raw water pollution. The recommendations which both federal and state services have made were to the effect that

1. Boiling the water would drive off the substances responsible for the objectionable tastes and odors.

2. A temporary intake should be sought in the Kanawha River in a zone of less pollution since the water plant was operating under too great a sewage load.

3. A new water works intake be provided so that 1930 drought conditions could not be duplicated.

INDUSTRIAL HYGIENE

EMERY R. HAYHURST, M. D., PH. D., AND LEONARD GREENBURG, M. D., PH. D.

Occupational Nystagmus in Train Dispatchers—*Summary:* Among the 121 train dispatchers examined, in widely separated sections of the country, and from seventeen railroads, occupational nystagmus has been detected, involving 81 individuals, or 67 per cent. In addition, in 2 cities, among 30 persons examined, 22, or 70 per cent, presented this condition.

The nystagmus found was essentially all horizontal, with marked variation in the rate of motion, and with some variation in the rates for the two eyes.

This train dispatchers' nystagmus appears to be unassociated with aural conditions, although occupational deafness of 56.2 per cent has been noted, which is more commonly present in the left ear, due to the wearing of the hearing mechanism on that ear. It is believed that the noises common to train dispatching are responsible for the occupational deafness.

The nystagmus encountered among train dispatchers is accepted as occupational in origin, and is attributed to the continual motion of the large paper train sheet beneath the eyes, and the movement of the head and eyes over the train sheet, both necessary in the continual recording of train movement data.

It is maintained that the high frequency of the use of eyes in connection with train sheet work leads to overworking of the ocular mechanism, resulting in a nervous syndrome characterized by nystagmus, blepharospasm, some visual impairment, and ocular discomfort.

This occupational nystagmus of train dispatchers is less severe than the average of miners' nystagmus, and no case has been encountered that in itself was to be accepted as the cause of total disability.—Carey P. McCord, Paper delivered before the Industrial Hygiene Section of the A. P. H. A. at the Fifty-ninth Annual Meeting at Fort Worth, Tex., October 30, 1930.—E. R. H.

Life Conservation Studies. Cardiovascular Lesions Among One Thousand Industrial Machine Operators. A Report of One Thousand Physical Examinations of Machine Operators—*Summary:*

1. One thousand machine and hand tool operators were carefully examined during the past year by the Heart Council of Greater Cincinnati.

2. Only 4 of these men were found essentially free from defects; 836 men out of the 1,000 had significant physical defects such as were considered to be likely to interfere with their general well-being and efficiency. The defects were unknown to 885 of the men, or at least they made no complaint of these defects at the time of the examination. In the opinion of the examiners, 874 of the group would definitely profit by early medical care.

3. Men under age 45 predominated in these occupations in Cincinnati.

4. One out of every 5 had never been vaccinated.

5. Thirty-one per cent had some significant cardiovascular defect. There was a definite upward trend in cardiovascular disease among this group after age 40 which corresponds to the mortality from this disease in the United States vital statistics. The incidence of cardiovascular lesions increased markedly with overweight in this group. The increase in the incidence of heart disease among overweight is especially great past the age of 40.

6. Overweights were prone to high blood

pressure; underweights to low blood pressure.

7. Albuminuria and glycosuria are both appreciably more frequent among those with cardiovascular lesions than for this group as a whole.

8. The query is definitely raised as to the relationship between mental strain and cardiovascular lesions in the light of the fact that the incidence of these lesions among this factory group where the mental strain is comparatively slight is less than among 1,000 clerks who work under a higher degree of a mental strain and about one-half as great as that found by McCord in a group of train dispatchers among whom mental strain is excessive.

9. Eighty per cent of these men have dental attention only in emergencies.

10. Three-quarters have some eye defect and a large percentage of the attempts at correction of these defects are unsuccessful.

11. Tuberculosis findings were incomplete because of the difficulty of securing X-ray examinations.

One definite and incontrovertible point brought out in the first two studies is the extraordinarily high incidence of physical impairments, much of which was unknown to the examinees, together with the high percentage of the men with impairments which the examiners believed could be remedied by medical care. The findings add significantly to the accumulating evidence of the importance of periodic health examinations.—William Muhlberg, Floyd Allen, and Bleecker Marquette (Cincinnati). Paper read before the Industrial Hygiene Section of the A. P. H. A. at the Fifty-ninth Annual Meeting at Fort Worth, Tex., October 30, 1930.—E. R. H.

An Industrial Health Survey of 1,000 Factories in Chicago—A simple questionnaire of 15 questions which could be answered by "Yes," "No," or a Figure, was sent to 1,584 factories, mercantile establishments, department stores, banks, laundries and others, the list being supplied from the Directory of the Illinois Manufacturers Association, from the Association of Commerce and a social agency of Chicago, the aim being to reach all plants with 25 or more employees. From this group, 584 were excluded because of several reasons, leaving 1,000 on which the study was made, or about 16 per cent of the original list.

It was found that: (1) 820, or 82 per cent, of the plants replying had less than 300 employees, and (2) 881, or 88 per cent, had less than 500. All industries in Chicago employing more than 1,000 employees replied to the questionnaire. Among the larger were 54 employing 500–999; 47 employing 1,000–4,999; 8 employing 5,000–9,999; and 10 employing over 10,000. The total employees in the 1,000 institutions were 500,642, of whom 438,948 were classified as to sex, there being 73 per cent male and 27 per cent female.

A survey of health service showed that 3 per cent had a hospital; 5 per cent had a dispensary; 52 per cent had a first aid room—this included any room in which a first aid kit was kept; 43 per cent had a doctor—here the doctor was on call in 82 per cent of instances; 12 per cent had a nurse, but only 72 per cent of these were registered nurses, while 1 per cent employed a part-time nurse; 35 per cent had agreements with local hospitals covering sickness and injuries; 13 per cent had employees' benefit associations; about 100 per cent were covered by compensation insurance; 33⅓ per cent had group life insurance; 49 per cent kept sickness and accident records—15 per cent kept accident records only; while 75 per cent of the plants wanted a report of the survey.

The significant facts revealed in this study were:

1. The medical service provided by Chicago industries is of a limited character as evidenced by the answers to the first five questions, especially in regard to medical and nursing service. The medical and nursing service for the most part is of an emergency character.

2. Adequate health work presumably can only be done by a full-time medical service. Indications of health work were not significant in this study.

3. Plants in Chicago apparently are quite interested in the general welfare of their employees as evidenced by the answers to the balance of the questionnaire.

4. The answers were classified according to size of the plant, but no startling evidence was revealed. For the most part the medical and nursing service is still concentrated in the larger plants, leaving the greater majority of plants without service beyond a strictly emergency character

There is evident tremendous interest in health among the employers and any program contemplated by a tuberculosis organization should include the large as well as the small plant. An educational program is clearly indicated from the above facts brought out by the survey and steps were taken to provide this service. "We are looking forward to the day when all cities with over 100,000 population will have a program. We in Chicago feel that industrial health, like community health, is purchasable."—Robert B. Watson, Industrial Secretary, Chicago Tuberculosis Institute. Paper read before the Industrial Hygiene Section of the A. P. H. A. at the Fifty-ninth Annual Meeting at Fort Worth, Tex., October 30, 1930.—E. R. H.

FOOD, DRUGS AND NUTRITION

WALTER S. FRISBIE

Biochemical Studies on the Antineuritic Vitamin—As a contribution to the study of the antineuritic vitamin, the authors describe a method of chemical purification which is controlled by the application of physiological test methods previously described by one of the authors (M. I. Smith, *Pub. Health Rep.*, 45 (1930), 116–129). The resulting product was further compared with a small supply of vitamin crystals obtained from Dr. Jansen and made by the Jansen and Donath method. The smallest curative dose of this type of the crystals was found to be 0.04 mg. containing 0.0069 mg. nitrogen. The most highly purified fraction obtained by the authors on the same basis required 0.05 mg. daily dose containing 0.0062 mg. nitrogen, indicating almost identical activity on a nitrogen basis, although the product described here does not crystallize. The vitamin is prepared from fresh brewer's bottom yeast by adsorption on fullers' earth after removing coagulated protein and insoluble matter. This so-called "activated solid" was further treated in alkali and acid solutions, extracting with chloroform and precipitating the filtered acid aqueous solution in acetone.

Further treatment is outlined for the separation of the sodium chloride, and by repeated precipitation a powder is obtained containing 7 to 11 per cent of nitrogen. The two samples analyzed yielded 0.1 and 3.3 per cent chloride. Several concentrates prepared by this method were administered to rats to cure polyneuritis. The activity of these concentrates ranged from 0.05 to 0.30 mg., the dose required to effect the cure of polyneuritis in rats on a diet adequate with the exception of this antineuritic vitamin.

Experiments were conducted on rats receiving a diet deficient in both the antineuritic and the thermostable vitamin (B_2 or G), and those on a diet deficient in the antineuritic vitamin

alone. After the rats developed polyneuritis symptoms, the autoclaved yeast was replaced by an equivalent amount of starch. The antineuritic concentrate was then administered intravenously in about 20 per cent of the minimal curative dose required. The animals recovered from polyneuritis but did not grow and their death followed in 22–32 days. Increasing the dose 5 to 10 fold prolonged the life of the animals sufficient to show skin lesions. With the daily injection of 1.0 mg. of the antineuritic concentrate to rats with developed polyneuritis and the administration of the thermostable factor normal growth resulted. It was concluded that this concentrate was highly active in antineuritic potency and probably free from the thermostable factor.—Atherton Seidell and Maurice I. Smith, *Pub. Health Rep.*, 45: 3194 (Dec. 26), 1930.

The Antirachitic Action of Cod Liver Oil and Irradiated Ergosterol in Parathyroidectomized and Thymectomized Rats—The observations of investigators who have studied the effect of antirachitic agents in the experimental tetany of dogs and monkeys are at least conflicting, both a loss and an increase in blood calcium being reported, the latter particularly with large doses of irradiated ergosterol.

In the present experiments, young rats, 25–40 gm. were used after complete extirpation of the parathyroids under anesthesia. The rats on a low phosphorus rachitogenic diet were given cod liver oil with a pipette. Radiograms were taken at the beginning and end of the experiments. A commercial irradiated ergosterol claiming a potency 10,000 times that of cod liver oil was diluted with 10,000 parts olive oil and administered by pipette. Consistent results are shown in 4 sets of experiments. Four drops daily of cod liver oil resulted in complete prevention and 4 drops for the last 5 days were a curative dose in the parathyroidectomized rats. Without the oil, rickets developed in both the untreated operated and unoperated controls. With two drops cod liver oil daily for the last 5 days marked healing occurred in parathyroidectomized rats and also in the unoperated controls.

Similar results attended the experiment using the commercial activated ergosterol and complete prevention in parathyroidectomized rats resulted with a daily dose of 1 drop of the diluted preparation. Marked healing occurred with 5 daily doses of 1 drop of the preparation both in parathyroidectomized rats and in unoperated controls.

The rickets were more severe in the operated than in the control rats. Sections of the neck organs showed that no remains of parathyroid tissue and accessory glands were in evidence. Results are shown in one experiment on rats after complete removal of the thymus glands. Two drops daily of cod liver oil gave complete protection in thymectomized rats as well as the unoperated controls and 5 daily doses of 2 drops showed a marked healing both in the operated and unoperated rats.

One experiment is reported on rats after removal of both thymus and parathyroids and administration of irradiated ergosterol. One drop daily prevented rickets, which developed in the unoperated controls. It is apparent that cod liver oil and activated ergosterol in therapeutic doses are antirachitic in the absence of either or both the parathyroids and the thymus.—Alwin M. Pappenheimer, *J. Exper. Med.*, 52: 805 (Dec. 1), 1930.

Vitamins in Sugarcane Juice and in Some Cane-Juice Products—This paper reports the results of experiments carried out to determine the vitamin B (complex) and vitamin D potency of the juice of sugarcane. The juice was obtained from 3 lots of sugarcane stalks shipped at different times

and from different sections of the country. In addition to estimating the vitamins in the juice, comparison was made of the vitamin B potency of juice obtained from different parts of the same cane stalk. Several sugarcane products, including cane sirup, and different samples of blackstrap molasses and cane cream were also examined.

From the growth curves given for the different experiments, sugarcane juice is found to be a poor source of the antineuritic vitamin. It contains a small amount of vitamin A and little, if any, vitamin D. The juice from the upper portions of cane stalks is richer in this vitamin than juice from the lower portions. Juice obtained from bagasse by using high pressure is richer in the antineuritic vitamin than ordinary cane juice. Cane sirup, Louisiana and Porto Rico blackstrap molasses, and cane cream, products made from sugarcane juice, were found to contain negligible amounts of vitamin B.—E. M. Nelson and D. Breese Jones, *J. Agr. Research*, 41: 749 (Nov. 15), 1930.

The Length of Survival of Paratyphoid Bacilli in Foodstuffs—The experiments reported in this paper are of considerable importance in clarifying the question of the longevity of members of the Salmonella group and their agglutinogens when they are introduced into commercially canned foods, such as spinach, corn, and peas. Several authentic strains of *S. enteriditis* and *S. aertrycke* were used as test organisms. Incubation at room temperature was used throughout the experiments.

Of the three vegetables used canned spinach was found the most favorable medium for growth for all the test organisms. Canned corn proved to be the least suitable medium for growth, especially when inoculated with strains of *S. aertrycke*. No viable organisms could be demonstrated in canned corn which had been inoculated with *S. aertrycke* after 21 days. In another instance some viable bacilli of this strain were recovered from corn after 75 days. All aertrycke organisms were dead after 100 days. Canned corn was somewhat more favorable as a medium for *S. enteriditis*, sterility being observed in from 90 to 170 days.

In canned peas, both organisms lived for at least 200 days. In canned spinach both organisms survived for much longer periods than they did in either corn or peas. In this vegetable, *S. enteriditis* was alive at the end of one year, while *S. aertrycke* was still alive at the end of 3 years. The persistence of the agglutinogens of these organisms in the canned vegetables was determined by the incubation of small amounts of liquor from the cans into rabbits and then testing the rabbits' blood serum for agglutinins. These tests were made 3 years after the canned vegetables were inoculated; during this period the bacilli had died in all cases—except that of *S. aertrycke* in canned spinach. In these tests, the thermostability of the various agglutinogens was observed. The injection of unheated inoculated canned vegetable material gave rise to easily recognizable agglutinins in all cases 3 years after the foods had been inoculated. Relatively slight heat apparently destroyed or greatly reduced the enteriditis agglutinogens. Some thermostability was observed in the case of enteriditis agglutinogens from canned peas.

The *S. aertrycke* agglutinogens were observed to be quite thermostabile, giving rise to definite agglutinins when heated material was injected into rabbits. The author found, in other trials, that *S. aertrycke* agglutinogens withstood autoclaving at 11 lb. pressure for 50 minutes. These observations are important as bearing on the possibility of detecting dead organisms of this group in heat preserved foods.—L. P. Doyle, *J. Infect. Dis.*, 47: 92 (Aug.), 1930.

CHILD HYGIENE

RICHARD A. BOLT, M. D., DR. P. H.

Racial Hygiene—It is quite evident that if any further decided reduction in infant mortality is to be effected it must be brought about by applying well known social, medical and hygienic principles to the prenatal, natal, and neonatal periods. Unquestionably, greater safeguards thrown about the prospective mother and more skilled attention at childbirth will preserve more infant lives and reduce considerably the risks to which both mother and babe are exposed. This, of course, will not affect appreciably the quality of those who survive. Why should this interest the health officer? Keeping down the morbidity and mortality rates is conceived to be his duty; he should not wander into the occult and controversial fields of heredity and eugenics. Does not the pasture of euthenics provide sufficient room for his exercise?

But the progressive health officer, interested in the broad field of child welfare, cannot overlook the problems of racial hygiene. Efforts toward conservation of children, communicable disease control, or development of more vigorous life meet at the threshold factors emerging from inherent defects of the individual, differing degrees of intelligence, and constitutional weaknesses. Whether he acknowledges these differences or not the public health officer comes face to face with them in his everyday dealings with enfeebled stock. Questions must arise regarding differential birth rates, feebleminded-ness, and the impoverishment of germinal plasm with so-called "racial poisons." Sooner or later the health officer will have to make decisions as to how far he feels it necessary to carry out education along the lines of social hygiene, whether to establish maternity clinics, or to lend his influence to the birth control movement. It seems proper to recommend, therefore, that the health officer inform himself broadly along these lines by reading books and articles from the pens of thoughtful investigators and writers.

A beginning might be made with such a thought provoking book as *Racial Hygiene,* by Thurman B. Rice. This is a very practical discussion of the problems of eugenics and race hygiene, written in an easy, straightforward style. To follow up the subject in some detail the list of references given by Rice might well be used.

Causes of Fetal Death—The suggestion is offered at the very beginning of this child hygiene series because in seeking the reasons for fetal and early infant mortality it is not possible to lay a finger upon the exact cause or causes in many cases. The very careful investigation into the deaths of 300 fetuses conducted by Eardley Holland * is an illustration in point. After exhaustive clinical, pathological, and serological studies, Holland found that in 11 per cent of the cases no definite cause of death could be determined. Other investigators have found that from 10 to 15 per cent of such cases show no evident pathological lesion to account for death.

On the other hand, enough reliable data exist to make possible the assignment of proper causes to many deaths;

* Report on the Causation of Foetal Death. *Reports on Public Health and Medical Subjects.* Ministry of Health of England, No. 7. 1922.

among these are syphilis, the toxemias of pregnancy, complications of labor, prematurity, and diseased fetal and maternal states. Great concern is manifest at present in the preventability of fetal and early infant deaths so intimately involving the life of the mother.

One of the most informative and constructive reports at the recent White House Conference was that on maternal and early infant care. It showed clearly the need for more precision in diagnosis and better classification of these cases; for better obstetrical education, and control of midwifery; for more widespread prenatal care of a thorough type, and especially for more skilled attention at time of birth, under favorable conditions, and with expert care for the new-born. This report naturally arouses inquiry as to how successful prenatal care has been in the reduction of maternal and early infant mortality.

Value of **Prenatal Service**—This can be answered best by the most outstanding continuous maternity care conducted in this country—the Maternity Center Association of New York. This association has carried out an intensive piece of work in New York City since 1922, and has kept such records that it is now possible to evaluate results in terms of mothers' and babies' lives saved. The routines established by this organization and the "Standards for Maternity Care" which it has set up have been taken as models throughout the country.

"A Recent Statistical Study of Maternity Care," by Louis I. Dublin and Hazel Corbin, appeared in the *American Journal of Obstetrics and Gynecology* for December, 1930. It points out that during the past 8 years the Maternity Center Association cared for 4,726 cases. Of this number, 28 per cent first came under observation before the 5th month of pregnancy; 34 per cent in the 5th or 6th month, and 38 per cent during the last 3 months of pregnancy. The following results are of particular interest:

1. During the entire period of 8 years no woman under care died before confinement.
2. Eleven mothers died after delivery from puerperal causes, making a rate of 2.2 per 1,000 live births, which may be compared with a total rate of 5.3 maternal deaths per 1,000 live births among white women in New York City. A more striking comparison can be made in the Bellevue-Yorkville district with the mothers who did not have the care of the association; a rate of 6.2 is shown which is nearly 3 times as high as for the mothers who had care in the same district.
3. There were 4,596 live-born babies, 123 stillbirths, and 132 live babies died before reaching 1 month of age.
4. There were 274 premature deliveries, 61 of which were miscarriages. The stillbirth rate was 26 per 1,000 births, which compares very favorably with the total rate for white babies in New York City in 1928, 50 per 1,000 births. The number of stillbirths was 42 per cent lower in the association group than in the rest of the district.

The neonatal mortality rate (under 1 month) was 28.7 per 1,000 live births. This was only one-third of the rate (42.9) for the rest of the Bellevue-Yorkville District.

It is impossible to escape the conviction that this work "demonstrates that, on the score of all essential indexes, prenatal care, as conducted by the Maternity Center Association, produces results."

There comes from an entirely different quarter a report which emphasizes the importance of prenatal care combined with good hospital care, or care in the homes. Sir Arthur Newsholme, writing in the *Quarterly Bulletin* of the Milbank Memorial Fund for July, 1930, gives an instance of exceptionally low maternal mortality for patients looked after by the East End Maternity Hospital of London. The maternal mortality of hospital patients over a series of years was remarkably low, being in 1921–1926 only 1.1 per 1,000 live births; from 1927 to 1928, 1.19, while the rate for patients delivered in their own homes was lower still, being 0.29

in 1921–1926, and zero in 1927–1928. Sir Arthur states, "there can be no question as to the importance of the rigidly required and cheerfully accepted antenatal supervision" in addition to the quality of the hospital work both in the hospital and among its outpatients.

More Exact Classification—One of the most enlightening studies available is a recent publication of the Health Organization of the League of Nations. It appears as a "Memorandum relating to the Enquiries into the Causes and Prevention of Stillbirths and Mortality during the First Year of Life," and covers studies made by means of a uniform inquiry form and uniform instructions to investigators in Austria, France, Germany, Great Britain, Italy, the Netherlands, and Norway. A definite attempt was made to secure data in such a form as to be comparable between various countries. To this end "Nomenclatures of the Diseases Common to the First Year of Life and the Causes of Stillbirths" are set forth. A decided step in advance toward better classification is given under "Definition of Dead Births," which it is thought of sufficient importance to quote here:

> The word "birth" means the separation and extrusion of a foetus from the body of the parturient woman. The birth is to be deemed complete at the instant when the whole of the body of the foetus—head, trunk and limbs—is outside the body of the mother.
>
> The birth is to be deemed a live birth if after birth (as defined above) the infant breathes.
>
> The act of respiration is incontrovertible evidence of life, and its continued absence is to be taken as proof of foetal death.
>
> It is desirable, for statistical purposes, that a distinction should be made between the birth of a foetus which can normally be expected to be capable of existence independent of its mother and the expulsion of one which cannot—births in the latter category being regarded as miscarriages (abortions).
>
> A foetus capable of an independent existence is a "viable foetus" and is the product of a gestation which has lasted at least 28 weeks. Such a foetus will normally measure at least 35 centimeters from the crown of the head to the base of the heel, the body being fully extended. The Committee is of opinion that the latter criterion is the more trustworthy.
>
> Hence a "dead birth" is the birth of a foetus, after 28 weeks' pregnancy, in which pulmonary respiration does not occur; such a foetus may die either: (a) before; (b) during; or (c) after birth, but before it has breathed.

Such a revision in the classification of causes of maternal and fetal deaths as would make possible not only more exact determination of the causes of death, but also an indication of preventability, is to be welcomed. An advance in this direction appears in the recently revised International Classification of Causes of Death. It follows closely that used by Dr. Guilfoy in New York State, and is here presented:

XI.* Deaths from Diseases of Pregnancy, Childbirth and the Puerperal State
- 140 Abortion with septic conditions
- 141 Abortion without mention of septic condition (to include hemorrhage)
- 142 Ectopic gestation
- 143 Other accidents of pregnancy (not to include hemorrhage)
- 144 Puerperal hemorrhage:
  - (a) Placenta previa
  - (b) Other hemorrhage
- 145 Puerperal septicemia (not specified as due to abortion):
  - (a) Puerperal septicemia and pyemia
  - (b) Puerperal tetanus
- 146 Puerperal albuminuria and eclampsia
- 147 Other toxemias of pregnancy
- 148 Puerperal phlegmasia alba dolens, embolus, sudden death (not specified as septic)
- 149 Other accidents of childbirth:
  - (a) Caesarean operation
  - (b) Others
- 150 Other and unspecified conditions of the puerperal state

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* Maternal Mortality in New York City, *Weekly Bull.*, Dept. of Health, City of New York, Dec. 13, 1930.

PUBLIC HEALTH NURSING

EVA F. MACDOUGALL, R. N.*

Concerted Action in Baltimore—According to the standard curriculum, public health lectures to student nurses constitute a required course in Maryland and have to be given by persons experienced in public health work. In 1925 the superintendents of 14 hospitals conducting nursing schools in Baltimore were invited to try out a plan to send all their nurses to one central gathering place where one series of public health lectures could be given to all, saving time and money which might otherwise have been expended in getting lecturers for each of the 14 hospitals.

In the fall of 1925 the first course, arranged by the Baltimore Health Department, was given. It consisted of 10 lectures given by officials chosen from the city health department, the Johns Hopkins School of Hygiene and the Maryland State Department of Health. Ten of the 14 schools invited sent their pupil nurses to these lectures and examinations were given at each hospital at the completion of the course.

The following year student nurses from all 14 hospitals participated, the lectures were increased to 12 hours, and a demonstration visit to the city health department was given. One college credit was given for this 15 hours' work.

The enrollment of nurses increased from 214 from 10 hospitals in 1925 to 356 nurses from 13 hospitals in 1930. (One hospital had closed after 1927.)

The conducting of these lectures is desirable not only because the lectures enable the hospital training schools to meet the standard requirements but because they will in the course of time give all of the graduate nurses trained in the city a better knowledge of preventive medicine and an interest in the health work of the community.—

V. L. Ellicott, M.D., *Baltimore Health News*, Dec., 1930, p. 78.

The Teacher's Morning Inspection in Communicable Disease Control—The school nurse has come to realize more and more the important rôle routine morning inspections play in preventing the spread of communicable disease in her schools. In many instances, she is fortunate enough to have the classroom teacher assume this responsibility, and as a rule the results are most gratifying.

However, how well equipped is our average school teacher to detect symptoms of a comunicable disease? A field supervisor in Indiana had a very enlightening experience a few weeks ago. A city school nurse was very much concerned because of a threatened scarlet fever epidemic in one of her schools. Upon inquiry, the supervisor learned that the teachers were giving daily inspections in order to weed out suspicious cases. Fine! but to her great surprise she found that one teacher's idea of symptoms of scarlet fever was "peeling hands and chest"—and every morning she diligently searched for "peeling hands." The school nurse was just as surprised as the supervisor; she had been quite sure that the teachers knew what to look for.

The average lay person has very little, if any, scientific knowledge of communicable diseases and it is up to us as

* Please send printed matter or other material relating to public health nursing to Eva F. MacDougall, 126 State House Annex, Indianapolis, Ind.

public health nurses to spread the light of the essential facts, at least, to as many people as we can. That is part of our preventive program. The majority of teachers are interested in the more commonly known communicable diseases and they will show great interest in the particular disease one of their own pupils may have developed. So—at least while the iron is hot, we should strike. If there is a case of scarlet fever, diphtheria or measles in our schools we should use that unfortunate incident as a golden opportunity to inform the teachers how scarlet fever, diphtheria or measles is spread. We should give a " demonstration inspection "—pointing out some of the definite symptoms—if there are any; and a talk to the students—whether in the 1st or 12th grade—should help the children and grown ups, too, toward developing a more sane and intelligent attitude toward the dreaded " catching sicknesses." —Henrietta Landau.

A Census of Nurses in Industry—In 1928 the National Organization for Public Health Nursing sent questionnaires to 2,200 industrial establishments located in all but 7 states of this country and in Hawaii. Information was received from 1,006 of these establishments employing 2,022 nurses. The following are some of the facts obtained:

1. The number of employees in the 24 different types of industrial and commercial concerns ranged from fewer than 250 to more than 10,000.

2. Eighty-five per cent of the total 2,022 nurses were registered nurses.

3. Practical nurses were found in 5 per cent of the establishments reporting, most of which had fewer than 1,000 employees.

4. Only 4 per cent of the total number of nurses were employed part time.

5. Establishments having 2,000 or more employees tended to employ full-time physicians, while those having 1,000 employees or fewer usually had physicians on call.

6. The great majority of nurses in half the establishments were professionally responsible to a physician.

7. The nurses in less than one-third of the establishments had standing orders.

8. Three-fifths of the establishments had nurses working inside only; some had nurses who visited the homes of employees, also.

9. Practically all the nurses gave emergency treatment of injuries and sickness. In descending order of frequency they gave the following services: (1) assisting the doctor in physical examinations, (2) health instruction to employees, (3) participation in safety program, (4) sanitary inspection of plant, (5) nurse examination (inspection) of employees, (6) assisting the dentist.

Routine visiting of absentee employees, usually those known or suspected to be sick, was the most common service rendered in the home.

In some establishments nurses gave health instruction in employees' families.

Comparative working hours of public health nurses:

Health Departments	44.7 hours per week
Boards of Education	39.7 hours per week
Public Health Nursing Associations	47.3 hours per week
Industrial and Commercial Concerns	48.8 hours per week

Louise M. Tattershall, Nurses in Commerce and Industry, *Pub. Health Nurse*, XXII, 12: 636–637 (Dec.), 1930.

EDUCATION AND PUBLICITY

EVART G. ROUTZAHN*

Are You "First" in Anything?—It is worth while to dig out the facts about the rank of your city or state in any phase of public health, especially if you have first place or even second or third; and then to check up to see if you have kept in the van of those who followed your wise example. You can use this information in writing and speaking, when timely, and in planning an anniversary or award of honor.

In *Better Times*, 151 Fifth Ave., New York, N. Y. (Jan. 5, 1931), a correspondent names the following "firsts" for Massachusetts: State Board of Health, State Tuberculosis Hospital, Clinics for Detection of Tuberculosis in School Children, State Cancer Hospital, State Mental Hygiene Clinics, State Hospital School of Crippled Children, State Requirement for Medical Inspection of School Children.

"The Foe of Youth"—This will be the theme of the "Early Diagnosis Campaign" by tuberculosis and other participating health organizations during April, 1931. Better and better is the assortment of about 30 items of campaign material, descriptions or samples of which will be supplied by the various state tuberculosis associations, or the National Tuberculosis Association, 370 7th Ave., New York, N. Y. Folders, booklets, posters, lantern slides, motion pictures (standard and narrow gauge), and electrotypes are offered, in addition to considerable national publicity. Especially good are the two-color letterhead and the 8-page pamphlet on "Laennec the Listener," the story of the stethoscope and its inventor.

It is a campaign for and by health departments and other health agencies, backed by many types of non-health organizations. The campaign is focused by tuberculosis groups which have created the opportunity.

Should not every health agency scrutinize carefully the material and plans to determine its own share in this opportunity?

Getting Together on Health Education—In 14 cities and states there are social work publicity councils. All of them include groups of health workers. In a score of cities there are small groups of members of the Public Health Education Section.

Why not a get-together session? Is there not enough material—are there not enough topics—in this issue of the *Journal* to talk about? Try it just once.

For further suggestions write to the editor.

"Keeping Up with the Joneses" Who Edit Magazines—"It takes all the running you can do to keep in the same place," is quoted by Arthur Dunham in a spritely article on "The Social Worker and the Scissors" in *Better Times*, 151 5th Ave., New York, N. Y., Jan. 5, 1931. *30 cents.* Please substitute "public health" for social work in the following:

Books and monographs relating to social work now pour forth in an unceasing stream.

* Please address questions, samples of printed matter, criticism of anything which appears herein, etc., to Evart G. Routzahn, 130 East 22d St., New York, N. Y.

But there is one substantial satisfaction about any given book or monograph: generally speaking, there is only one of it!

Not so with the social work periodicals. Finish one issue and lay it aside with a sigh of virtuous satisfaction; the next blast that sweeps from New York brings to your table a new issue, and two other magazines which you had for the moment forgotten.

Allow two successive issues of the same magazine to lie unread and your doom is all but sealed. You lose out on current news. . . . You hear nought of new experiments (called "demonstrations") and new developments in your own field; you smile vaguely and feel inferior when an irritatingly well-read colleague or an omniscient out-of-town speaker alludes airily to that intriguing article in the current issue of The Social Worker's Companion. And all the while your stacks of magazines, like the reports described by Walter Lippmann, mount higher and grow mellow and more mellow on your own desk.

. . . There are, however, a few practical suggestions which, if consistently followed, may give the social worker at least a sporting chance of holding his own in the magazine marathon. Here are the suggestions:

1. Put magazine reading into your program. If you haven't a program, read Arnold Bennett's "How to Live on Twenty-Four Hours a Day," and try making one. Magazine reading takes time—just like interviews, "conferences," bridge, and detective stories. . . .

2. Limit your aims. You can't read everything that is written on social work. The most you can hope to do is: (1) to keep up technically and thoroughly with one specialized field of social work—two fields at the most; (2) to maintain an intelligent "current events" or background knowledge of the progress of social work as a whole.

3. Select your magazines with these aims in mind. . . .

4. Develop a technic of reviewing periodicals. Cultivate the art of skimming the unimportant and concentrating on the important. Abbe Dimmet, in *The Art of Thinking*, has charmingly told "how to read the newspaper":

"Others again—few in number—armed with a red pencil and big scissors sit beside a pile of newspapers which they treat unceremoniously indeed. Half the sheets are flung aside while the rest are eagerly but quickly gone over, the red pencil every now and then zigzagging through a column. In less than an hour the seven or eight newspapers have been gone through and the red-marked pages alone strew the table, sofa and piano. Then the big scissors come into play."

5. Clip your magazines. Generally speaking, the idea of keeping a complete file of a magazine is a delusion and a snare for an individual. . . .

Clipping is infinitely simpler and more satisfactory. Mark the articles which you want to clip, while you are reviewing the magazine. Select for clipping articles which you will probably want to refer to again, because of their permanent value or their importance to your job.

6. Identify your clippings. Write the name of the magazine (abbreviated) and the date of the issue on each clipping. . . .

We are promised an article on filing clippings by Mr. Dunham, but in the meantime would like to hear how some of our readers manage this job.

From the Outside in—Is there a hidden "moral" here for public health workers?

Never before in modern business have merchants become so keenly aware of the fact that the customer is king. Stock is bought, windows trimmed, interiors arranged, salespeople hired and fired, merchandising plans made—all with one eye on the buying public. It is because merchants frankly acknowledge today that they must run their stores from the outside in, rather than from the inside out—that it has become more necessary than ever before to have an accurate and complete close-up view of the buying public.

"Study Your Customers," by Ruth Leigh, *Publishers' Weekly*, Sept. 6, 1930, p. 915.

What Do You Want at Montreal?—Early in January the Council of the Public Health Education Section will meet to plan for the Montreal program and for any possible Section activities before the October convention.

What do you want? Or object to? Or what do you suggest for consideration? Please write to any Section Council member, or to the editor.

The New Mother's Day—A new meaning is to be given Mother's Day, this coming May 10. National pub-

licity emphasizing the high maternity death rate in the United States will precede May 10, according to the Maternity Center Association, 578 Madison Ave., New York, N. Y.

Another Campaign Opportunity—More than 7,000 communities participated in the 1930 Better Homes Week. How sanitation and health will secure recognition in the 1931 campaign is largely up to the health agencies. April 26–May 2 is the 1931 date. Better Homes in America, 1653 Pennsylvania Ave., Washington, D. C., will supply the needed information.

MAGAZINE ARTICLES

Popular articles on disease and health appear in a wide range of periodicals. Professional public health contributions from Dr. Louis I. Dublin and Dr. James A. Tobey have appeared frequently in magazines of general circulation. Doubtless more articles from A. P. H. A. members would be welcomed by editors.

Editors of health department or association bulletins or house organs could do much worse than to quote liberally from many of the published articles listed in this department.

In many cases permission would be given to make quotations to be supplied to factory and office employees' bulletins and other local publications.

"Birth Control and the Moral Law," by Dean Inge. *Atlantic*. Dec., 1930.

"The Common Cold," by Hugh S. Cumming. *Journal*, National Education Assn., Washington, D. C. Nov., 1930.

"For a New Year of Health," by G. F. Alsop. *Woman's Journal*, 171 Madison Ave., New York, N. Y. Jan., 1931. *25 cents*.

"Lady Doctor of the Helderbergs," by J. P. Gavit. *Survey Graphic*, 112 East 19th St., New York, N. Y. Dec., 1930. *30 cents*. Baby welfare and medical service in a New York backwoods section.

"Mental Health at Moderate Cost," by Mary Ross. *Survey*. Nov. 15, 1930. *30 cents*. Hospital psychiatric service in terms of "Mr. Thompson."

"New Theory of Tooth Decay," quoting Dr. C. F. Bodecker of Columbia University. *Literary Digest*. Jan. 3, 1931.

"Our Menacing Toll of Accidents Attains a New Peak," by Louis I. Dublin. *New York Times*. Dec. 1, 1930. "100,000 deaths our tribute in 1930."

"Science's War for Humanity," by Dr. Francis Carter Wood. *New York Herald-Tribune Magazine*. Dec. 14, 1930.

"When Doctors Disagreed," by J. P. Murphy. *Survey*, 112 East 19th St., New York, N. Y. Dec. 15, 1930. *30 cents*. Sympathetic but critical appraisal of the White House Conference.

PUBLIC SPEAKING

Some topics for health talks: "Why Insist on Dying of Cancer?"; "How to Be Happily Born" (prenatal care); "The Sneak and the Mimic" (syphilis); "Patrick, it's bedtime!" ("the unrested child"); "The 'Don't' Mother and the 'Won't' Child" ("insidious parental habits"); "Are You Paid Too Much?" ("economic value of fitness through games and sport"); "Ringworms Round Rosie" ("and other skin troubles in childhood"); "Zulu Beauty Culture" ("has it a place in Canadian civilization?"); "Diphtheria the Outlaw" ("in Germany a death from diphtheria entails legal action against those responsible"); "Growing Pains" ("a stop-look-listen sign: acute pain in or near a joint may be very serious"); "Tremendous Trifles" ("the small, trivial injury"). The above come from the newly organized Greater Vancouver Health League, a branch of Canadian Social Hygiene

Council. From the Winnipeg branch come these titles: "Our Grandmothers as Physicians"; "Therapeutics of the Bible."

NEW

"The Sight-Saving Review," National Society for the Prevention of Blindness, 370 7th Ave., New York, N. Y. First quarterly issue in March.

Designed to meet the needs of state and local prevention of blindness workers, educators, illuminating engineers, school physicians and nurses, safety engineers, public health administrators, industrial physicians and nurses, sight saving class teachers and supervisors, ophthalmologists, and anyone interested in the sociologic phases of saving sight.

The 80 pages will contain original articles, abstracts from current periodicals throughout the world, book reviews, and reports of the Society's activities.

$3.00 a year. Samples free. The *News Letter on Sight Conservation* will be continued in reduced form and more popular content.

LISTS

Nurses holding executive positions in states, and officers of state public health nursing organizations. *Public Health Nurse.* Jan., 1931.

Whole-Time County Health Officers. *Public Health Reports.* Dec. 19, 1930. Supt. of Documents, Washington, D. C. *5 cents.*

VOLUNTEERS

All types of health agencies will be interested in "Volunteer Service for Public Health Nursing Organizations" in *Public Health Nurse,* 370 7th Ave., New York, N. Y. Jan., 1931. *35 cents.*

During the fall of 1930, questionnaires were sent by the National Organization for Public Health Nursing to a group of urban public health nursing associations, county health organizations, city health departments, and to school boards, requesting information as to the services which volunteers were rendering. The replies are summarized here, rather informally, and a few general principles deduced from the experiences reported.

In this study, a volunteer job is defined as one that would call for the work, other than nursing, of a paid member of the staff, or the paid work of an outsider, if the volunteer did not do it. The service offered by officers and board members of the organization incident to their positions as administrators is not included.

The replies cover types of service, how recruited, where volunteers come from, training, supervision, advantages and disadvantages. This department is interested because of the potential publicity value of every volunteer. Outside of campaigns few health agencies have discovered the varied publicity services possible through volunteers.

In November a 3-day institute in New York City was attended by 200 board members of nursing organizations from 50 cities in 9 states!

PICTURES WANTED

Our hygiene class is studying the lives of various heroes of health. We are also making a scrapbook in which we would like to put the pictures of these great men. . . .

Could you help us?

The following are the men about whom we are studying:

Jenner	Lister
W. Reed	Wm. Roentgen
Pasteur	Robert Koch
Grenfell	Ser. F. Branting
Theobald Smith	Florence Nightingale
Alexis Carrel	

If you have pictures of others we would appreciate having them.

The New York Academy of Medicine, 2 East 103d St., New York, N. Y., will supply 5 x 7 photographs of the above at $1.25 each. Photostats $.25 to $.50 each.

Are there any better portraits obtainable, and at less cost?

Will an insurance company or some one else provide a *printed* set of portraits for school use?

WHY DO THEY DO IT?

A memorandum of health activities in a city, located east or west of Montauk Point, is headed

A Review of New Activities initiated or accomplished at . . . during the past ten months.

But the memorandum is not dated! Nothing but a real letter is dated—according to the average stenographic mind. The way to avoid trouble in filing and sending out undated material is to have an office rule that *all material* going through a typewriter shall be dated *unless* contrary instructions are issued.

A 4-page T.A.T. folder of special merit is issued by "the Health Department" in some unnamed city. Why the modesty?

REPORTING

"Pursuing Health with one of Henry's Fords" is the cover-page statement, and "or a Day with one of the Dutchess County's Public Health Nurses" is the sub-title across the inside flap of the gaily illustrated folder. It tells all the average person could wish to know about the public health nurse. Paper, typography and layout are way above the average. Dutchess County Health Assn., 16 Cannon St., Poughkeepsie, N. Y. *2 cents.*

On the afternoon of December 31, 1930, Health Commissioner Shirley W. Wynne submitted to the Mayor of New York City an 11-page summary report of department activities for 1930. Nearly 200 radio talks were delivered. "More space has been given (in the newspapers) to public health and to the education of the public in health matters than ever before." Of special interest is the war on quacks:

> Renewed widespread activities of medical quacks, charlatans and peddlers of questionable nostrums caused the department to take definite action against this menace to health during 1930. The department made a special appeal to the Federal Radio Commission for assistance in barring these quacks from the use of the air.
>
> As a further aid and safeguard in this campaign, the department, through the assistance of the National Better Business Bureau, has been able to compile what the press has called "The Medical Rogues Gallery," in which upwards of 25,000 names and addresses of quacks, charlatans and manufacturers and peddlers of nostrums have been alphabetically arranged. This is the first time any Department of Health has taken such a step and the directory, it is expected, will form the nucleus of a national gallery in the very near future. When this is completed, any radio broadcasting station can obtain a complete history of any quack who applies for time on the air.

"In Which The Public Health Federation Reports" is the non-report looking cover-title of the 1930 report of the Public Health Federation, 312 West 9th St., Cincinnati, O. Including its brief mention of city, county and state health departments the report offers a cross-section of the diverse health activities of a large city. The newest of the councils within the Federation, the Health Education Council, is explained:

> It is made up of physicians, dentists, nurses, health educators and lay people representing public and private health organizations interested in health education, and of general publicity and advertising experts.
>
> The purposes of the council are to coördinate the health education activities of private health agencies, to render such assistance as possible to public health departments, to advise and assist in conducting health education campaigns and programs, to endeavor to prevent overlapping and duplication of health education activities in Cincinnati and Hamilton County.

"Our famous Paul Revere was the first chairman of Boston's Board of Health, and the country's first State Board of Health was established in Massachusetts in 1869."—This the opening paragraph of a leaflet contributed by Massachusetts Dept. of Public Health, Boston, to the Massachusetts Bay Tercentenary. *2 cents.*

In *Public Health News,* New Jersey Dept. of Health (Oct.–Nov., 1930), appears "The Year in Review"—tells how "Education Is Often An Indirect Achievement" and that "Education Accomplished by Many Activities."

Transition from policeman to teacher has affected both the work and point of view of health officials. So true is this that nearly every activity of the State Department of Health attempts more or less directly to instruct, interest and lead local officials and citizens to do the right thing for their own well-being and that of their neighbors.

MOTION PICTURES

The Amateur Cinema Club of Toronto, Canada, has been providing amateur movie programs for the patients of Christie Hospital.

American Cancer Society is booking a new picture (both 16 mm. and 35 mm.) of both living normal and cancer cells.

"Clara Cleans Her Teeth," a new film on dental hygiene in 16 mm. narrow gauge stock, is being distributed by New York State Dept. of Health.

Five simple rules for the writing of captions—in "Recipes for Titles," by A. L. Gale. *Movie Makers,* 105 West 40th St., New York, N. Y. Jan., 1931. *25 cents.*

Did you see the Red Cross Roll Call "talkie"? A trailer of 150 feet of "action-filled film." *Sold at $15.00. $7.50 for the silent version.*

Exceptional was the procedure of the National Society for the Prevention of Blindness in asking for outside criticism and counsel on a new picture recently. *Before the final continuity was decided* the picture was assembled and submitted.

To keep in touch with motion picture thought and developments around the world consult *International Review of Educational Cinematography,* 1-A Via Lazzaro Spallanzani, Rome, Italy. The English edition should be available in large public libraries. For a classified table of contents showing numerous references to health and hygiene send a stamped and addressed envelope to this department.

On the market: a portable sound movie outfit with hand-microphone. You can add the "talkie" to a "silent"; or double with a "talkie." For address write *Movie Makers,* 105 West 40th St., New York, N. Y.

HONORABLE MENTION

To Indiana Tuberculosis Commission: for annual report not looking like an official state report (but the paper did not need to shine).

To Attleboro, Mass., Health Department: for the prominence given to "Health Education and Publicity" in an annual report.

A REQUEST FROM INDIA

Will you send some material? If convenient please tell the editor that you have done so.

For the benefit of health workers and others we are planning to have occasional exhibitions, showing the aims and objects and the type and extent of health education and practical work that is being carried out or has already been accomplished by the big organizations of the world.

May I request the favour of your very kindly helping in the matter by sending this office such literature and other material as you may be able to spare and which may serve the object.

Statistical charts, specimen propaganda literature, in way of booklets, pamphlets, bulletins, posters, pictures, etc., including an annual report, will be highly appreciated.

Hoping to be obliged at an early date.

Signed by Harnath Singh, D.P.H., Publicity Officer, Public Health Department, Punjab, Lahore, India.

BOOKS AND REPORTS

On the State of the Public Health—*Annual Report of the Chief Medical Officer of the Ministry of Health for the Year 1929—By Sir George Newman. London: His Majesty's Stationery Office,* 1929. Price, 3s., 6d.

It is safe to say that there are no more enlightening documents on public health than those written by Sir George Newman, Chief Medical Officer of the Ministry of Health of England. While they discuss affairs which belong to that country, they are none the less enlightening and useful to those interested in public health in every part of the world.

Some English reviewers point out that the present volume is not as optimistic as usual and confess that 1929 was a bad year, with happenings calculated to give grave anxiety to the health authorities. While we cannot entirely agree with this, the report does point out certain evil tendencies and gives warnings which should be heeded.

It has been evident for some years that both birth and death rates were declining, the proportion of children decreasing, and those past the prime of life increasing, the result being that the average age is steadily rising, making the ratio of deaths to population more unfavorable than formerly. In England the natural increase in population, which was 5 per 1,000 in 1928, was only 2.9 in 1929, indicating one more step toward a stationary population.

The total number of deaths showed an increase of 72,103 over 1928, with a rate of 13.4 per 1,000. Of these, 34.91 per cent occurred under the age of 50; the death rate of infants under 1 year was 74 per 1,000 births. Sixty-four per cent of the total death rate was due to: (i) diseases of the heart and circulation (225 per 1,000 deaths); (ii) bronchitis, pneumonia, and other respiratory diseases (157); (iii) cancer (107); (iv) diseases of the nervous system (82); (v) all forms of tuberculosis (71). It will be noted that cancer ranked third as a cause of death, the rate being higher than that recorded in any previous year.

Practically every subject which would interest those concerned in public health is treated in order, and the entire report reads more like that of an institute for research than a bare statement of figures such as we usually expect from a board of health. Considerable space is given to education, the author laying stress on the educational value of the development and extension of sanitation, believing that they have a far-reaching effect in developing the "*will* for health," holding also that, far from decreasing voluntary efforts, it has increased them. Both scientific and popular bodies, as well as such movements as the Boy Scout, the Woman's Institute, Industrial Welfare, etc., show great activity. A note of warning is sounded against "an orgy of public effort or public demand of doing something for everybody," since this may lead to a decrease in the sense of individual responsibility, and the necessity of people doing something for themselves.

This report is commended to all health officers and others interested in public health as a document which stands preëminent. M. P. RAVENEL

Treatment of Epilepsy—*By Fritz B. Talbot, M.D. New York: Macmillan,* 1930. 308 pp. Price, $4.00.

The current opinion of a number of school health administrators is that epi-

lepsy is on the increase among school children. Whether this is a real or only apparent increase, it is difficult to decide. It may arise from the change which has been taking place in our conception of epilepsy from that of definite disease entity to a symptom complex, resulting from a number of causes. This is clearly pointed out in Talbot's recent book where he takes up in order all the possible etiological factors and their interrelations. The pathology, diagnosis and cardinal symptoms of each type of the syndrome are concisely stated.

Talbot is perfectly correct in his statement that, "although by far the majority of subjects are adults, epilepsy should be considered a disorder of childhood and youth because it most often begins during the early years of life."

Considerable attention is given to the dietary treatment of epilepsy, which the author feels is of great value. A thorough discussion of the Ketogenic Diet from both a theoretic and practical basis takes up the major part of the volume. An excellent bibliography is provided. The format of the book is up to the usual standard of excellence of the publishers.

R. A. BOLT

The Book of My Life (De Vita Propria Liber)—*By Jerome Cardan. Translated from the Latin by Jean Stoner. New York: Dutton,* 1931. 331 pp. Price, $3.50.

All who are interested in history owe a debt of gratitude to the translator for this English version of the autobiography of that remarkable man, Girolamo Cardano, known to the English world as Jerome Cardan, who has been described as "sensitive, affectionate, introspective, imaginative, superstitious, humorous, inclined to ideas of self-reproach, with high ambition and hypomaniac industry," and also "the wisest fool and the most foolish wise man of his time." He was skilled in gambling, music and fishing, but most expert in gambling, having paid his way at Padua by the practice of this art, though he wrote an excellent book advising against it, but giving instruction in it.

He was born at Pavia, September 24, 1501, and died at Rome, September 20, 1576. Fate seems to have been against Cardan. His parents lived apart and his mother tried to destroy him in infancy, while his father maltreated him. It was not until he was 19 years old that he began to receive ordinary instruction in the gymnasium, but in two years he had become so much a master of medicine, mathematics, and philosophy that he was able to discuss these subjects publicly. In his 23d year he went to Padua, was graduated a year later, practised in small towns with some success, and, approximately 10 years later, was called as Professor to Milan. He was 39 years old before he overcame his early handicaps, became prosperous, and lived in some comfort. Later he became perhaps the most famous physician of his time and received many honors at home and abroad.

His has been described as one of the three great autobiographies in literature. It is an interesting document from every standpoint. It has been abused by some, but praised by many of the great men of the 17th and 18th centuries. He is regarded by many as having been the first to show what we now call the scientific spirit, and to have originated the "new order which was to change the face of the universe."

It is hard to give a fair analysis of his ideas. We must remember his background and the times in which he lived. He believed in astrology and omens, yet was one of the great mathematicians of his time, and responsible for introducing algebra into the schools of Europe. He subjected himself to pitiless analysis

on the one hand, and showed conceit on the other, having recorded a list of 73 illustrious men who gave testimony concerning him. He wrote a number of books on mathematics, astronomy, physics, morals, medicine and divination. He believed in guardian angels, one of whom, he said, attended him for much of his life, though not recognized until the 74th year of his life.

From our standpoint, one of the most interesting chapters is that on his successes in practice, particularly the cure of John Hamilton, Archbishop of St. Andrew's, who for 10 years had suffered from asthma which all physicians had failed to relieve. Cardan prescribed rules for living, among which was the discarding of a feather bed and the use of a linen pillow. The Archbishop improved so rapidly that one cannot help wondering whether he was not hypersensitive to feathers, and if we have not here probably the first case on record of the cure of an allergic disease.

It is impossible to give a fair idea of this book within the limitations of an ordinary review. It must be read to be appreciated. The translator has done an excellent piece of work. Thirty pages of notes explain references and give brief sketches of the many persons mentioned in the text. The printing, illustrations and make-up of the book are all that can be asked.

M. P. RAVENEL

Studies of the Efficiency of Water Purification Processes—*IV*. *Report on a Collective Survey of the Efficiency of a Selected Group of Municipal Water Purification Plants Located Along the Great Lakes: Public Health Bulletin No. 193—By Sanitary Engineer H. W. Streeter. Washington: U. S. Public Health Service*, November, 1929. 100 pp.

This bulletin deals with the efficiency of municipal water-purification systems located along the Great Lakes, from which approximately 10,000,000 people derive their water supply and into which the sewage and industrial waste of about five and one-half million population are discharged. The report is based on a survey of 14 representative municipal water filtration plants situated on the Great Lakes and connecting waterways, including the plants of Detroit and Cleveland. The survey, which was made at the joint request of interested local and State authorities, was an extension of previous surveys of a similar nature made along the Ohio and other rivers of the Middle Western and Eastern States.

Owing to the great importance of the Great Lakes region from standpoints of population, commerce, and industry, the maintenance of safe water supplies along these Lakes constitutes one of the major water-purification problems of the country. With the increasing pollution of sources of water supply located in various marginal zones of the Lakes, this problem is becoming a more difficult one each year, taxing at present, in some instances, the resources of modern water purification.

The difficulties of obtaining safe purified water supplies from the Great Lakes are magnified considerably by the extreme variability existing in conditions of pollution of the lake waters at the several water intakes, which are located in or close to marginal zones of shore pollution, where water movements are subject to the vagaries of winds and countercurrents. In some instances the pollution of these zones probably is subject to seasonal variation, due to large increases in the sewered population residing along the Lakes during the summer vacation season.

A study of the performance of the 14 Great Lakes plants included in the survey revealed some interesting similarities and contrasts in the behavior of these plants, both among themselves and in comparison with purification

systems of the Ohio type. Perhaps the most striking similarity observed was the existence, at practically every plant, of a well defined relationship between the bacterial quality of the raw water, as delivered for treatment, and the corresponding quality of the effluent produced at each successive stage of purification. This same relationship, which is one of fundamental importance, had been noted previously in studies of water purification on the Ohio River and on other rivers.

The most important dissimilarity observed was the marked variability in average bacterial efficiency shown by the several Great Lakes plants among themselves and their disparity in this respect from Ohio River plants of the same general type. Among the Great Lakes plants, divergences in efficiency were indicated as being due in some cases to differences in the average density of raw water pollution and in certain features of plant design and operation. In other instances no reason could be assigned for the inequalities noted.

As regards the comparative bacterial efficiency of the Great Lakes and the Ohio River plants, the former were shown consistently to be slightly less efficient with chlorination included, and decidedly less efficient with chlorination excluded, than the latter group. Detailed analyses of the data failed to disclose the reason for these divergences, which do not appear to be explained as currently assumed, by the relatively lower turbidity of Great Lakes water. It is suggested that they possibly may be due to differences in the chemical composition of the two waters, notably in the hydrogen-ion concentration.

From a study of the relationships observed between the bacterial qualities of the raw waters and effluents of the Great Lakes plants, and from an analysis of their variations, it was concluded, in so far as the production of final effluents conforming to the revised Treasury Department *B. coli* standard is concerned, that an average density of *B. coli* in Great Lakes raw waters, as delivered for purification, approximating an index of 4,500 per 100 cubic centimeters, appears to represent an upper limit of permissible pollution, beyond which a majority of the Great Lakes filtration plants, as at present designed and operated, would be clearly overburdened. Mean densities ranging from 1,000 to 4,500 per 100 cubic centimeters represent a doubtful zone, within which some plants might be and others might not be overburdened for a significantly large proportion of the time. With average densities ranging below 1,000 per 100 cubic centimeters, the majority of such plants would not be expected to be overburdened except for a comparatively small proportion of the time.

Among the areas studied, the most highly polluted zone of the Great Lakes from which water is taken for purification was located at the extreme southern end of Lake Michigan, where existing purification systems are clearly overburdened. Other zones of relatively high, though not in all cases excessive, pollution were found to be at the extreme western end of Lake Erie, at the outlet of the Detroit River, and along the southern shore of Lake Erie between Cleveland and Sandusky.

H. W. STREETER

Medizin, Gymnastik und Pädagogik im Kampfe gegen die Tuberculose Harmonische Behandlung—*By Prof. Dr. Eugen Kisch. Leipzig, Verlag Georg Thieme,* 1930. 83 pp., 83 figs. Price, 5.90 Marks; bound, 7.30 Marks.

Dr. Kisch, medical director of the Institute for Bone and Joint Diseases of the city of Berlin and of the Tuberculosis Sanatorium in Hohenlychen, gives the technic and results of heliotherapy

as applied by him in the treatment of tuberculosis of the bones and joints. In the preface Professor A. Bier bewails the fact that the idea is prevalent that it seems to be more important to heal the sick of their diseases than to keep well persons from becoming sick, and cites the experience during the war of the ill effects of prolonged hospitalization upon even the best of the soldiers.

In his sanatorium practice Dr. Kisch uses largely the outdoor life and physical activity favorable for the healthy in his restoration of the tuberculous children to health, but directs, supplements, and extends the exposure of the body at all seasons of the year to the direct action of the sun's rays. It is his contention that it is the heat rays rather than the chemical rays which are most effective. They induce up to a sevenfold increase in local circulatory activity, and the hyperemia continues for several hours after the cessation of the exposure.

Gymnastic exercises, sports and work suited to patients are utilized in connection with exposure of the body. Typical schedules of exposure times and regions of the body are cited and the indications for treatment are discussed. Results of this treatment are tabulated and particular cases illustrated fully by photographs and roentgenographs. These indicate a high degree of success.

C. A. KOFOID

Eat and Keep Fit—*By Lyman F. Kebler, M.D., M.S. Washington, D. C., 1322 Park Road: Lyman F. Kebler,* 1930. 302 pp. Price, $3.00.

The author was the late Dr. Wiley's right-hand man for many years and did the medical and chemical work for the postal authorities, the governmental agency which has helped more than any other, and perhaps more than all others put together, in putting fraudulent food manufacturers and advertisers out of business. He therefore has had an enormous experience in his special line and is well prepared to write on his specialty.

In addition to many standard tables which are found in works on physiology and foods, the book contains a large number of diets and menus, and if followed, the advice given will doubtless serve a good purpose. Fortunately, the craze for the boyish figure shows signs of abatement. Those who really suffer from overweight and wish to reduce can do so without impairing their health by following the recommendations given.

Unfortunately, as we believe, the author recommends some foods which are not entirely free of the charge of being quack remedies. Certainly the advertisements concerning them are open to this charge.

There is an introduction by Dr. Wiley, who opposed food quackery of every sort, and mentioned particularly one of the breads which the author has assisted in advertising and which he mentions in this book. It is a pity that such a good book is marred by this defect.

M. P. RAVENEL

Sterblichkeit und Todesursachen in den Kinderjahren—*Eine Sozialhygienische Untersuchung in den vier grössten Städten Schwedens—By Einar Rietz. Upsala,* 1930. *In Acta Pediatrica.* Vol. IX, Suppl. III. 175 pp., 27 figs. in text.

This study is based on the vital statistics of four Swedish cities, Stockholm, Gothenburg, Malmö, and Norrköping, with a combined population in 1927 of 874,733 inhabitants and a total of 23,953 deaths in the ages of 0–15 years between 1913–1927 out of 200,889 births.

The results indicate that the infant mortality of the first month is increased and the distribution of the causes of death in that period is modified by maternal [hereditary would be better]

factors or by conditions attending birth. After this period the factors of nutrition and care predominate. In the first month the male mortality in relation to the female is 135.4 per cent and is higher in the illegitimate (141.8) than in the legitimate infants. The male-female ratio has risen from 129.9 per cent in 1901–1910 to 136.4 per cent in 1921–1923.

Declining infant mortality exhibits a selective action among the various causes of death. There is both an absolute and a relative decline in deaths from gastrointestinal diseases as a result of proper care. There is also a decline in mortality from respiratory and infectious diseases. Diseases resulting from inherited tendencies show a considerable though more gradual decline during the period 1901–1923. The infant mortality decreases with the age of the mother and the income of the father. It is higher (19.0 per cent) in illegitimate than legitimate children. After the first year the infectious diseases are the main causes of death. Each has its own characteristic distribution within the years of childhood. Dampness in dwellings raises the mortality threefold in respiratory diseases, measles, whooping cough, rachitis, and convulsions, and has most influence on children of the age of 1 year. CHARLES A. KOFOID

Mental Hygiene and Social Work—*By Porter R. Lee and Marion E. Kenworthy. New York: Commonwealth Fund Publication,* 1929. 309 pp. Price, $1.50.

This is a description of the organization, activities and results of the work done by the Bureau of Children's Guidance in the New York School of Social Work, and the Department of Mental Hygiene connected therewith.

This bureau was the organization for the treatment of problem children and for the training of social workers in the management of psychiatric problems. It was established in 1921 and maintained for 5½ years. This report covers that period. It appears to be quite as frank in presenting failures as in recounting successes and is the more valuable on that account. Until recently such matters would perhaps have seemed outside of the scope of public health. With the tendency of the present time to extend the interests of the health officers into the field of mental health, such a volume will be read with something more than sympathetic interest.

There were 591 children treated, ranging in age from just past infancy to the threshold of maturity. The general objective was better adjustment of the child to his environment. This commonly implies: changes in the attitude of the child toward himself and his environment; changes in the attitudes of the parents toward him and toward other factors in his environment; and changes in the attitude of the school toward him and his home. Certainly a thorough repair and betterment of a faulty situation! The results were success in 48 per cent; partial success in 31 per cent; failure in 21. Greater success was obtained in the later years of the operation of the clinic. A special method was devised for evaluating the results: on one side, the opinion of the staff; on the other, the opinion of the parent. The two almost always agreed. The parents rated a few more cases as successful than did the staff. Very effective illustrations are found in the case histories quoted.

The other phase of the bureau's report deals with its vocational program. Scholarships were given those in training for psychiatric social work. A qualified psychiatric social worker is described as one who has achieved mastery of the subject matter of psychiatry not ordinarily achieved by social workers, and a mastery of social case work not ordinarily achieved by psychiatrists.

Courses in mental hygiene were designed to insure that the student's growth in the understanding of social psychiatric principles be steady and consistent and finally include the more complicated problems of personality adjustment. Field work is held to be the foundation of professional education for social work. Certain principles and methods of field work pedagogy have been developed: (1) A definite sequence of experiences for the students. (2) Opportunity for students to do their own thinking and to seek teaching because of a consciousness of need. (3) Supervision given through conference. (4) Group conferences, including perhaps psychiatrists, supervisor and other students. (5) Routine requirement of reports on the progress of cases. Field work and class work were parallel from the beginning of the course.

The school was of graduate rank and 90 per cent of the students were college graduates. Personality was the basis of selection. Over 900 different students took courses in mental hygiene, and over 200 took field work at the bureau. There were 70 fellowship students and 44 graduates in mental hygiene. Many of these women took positions of responsibility.

This volume treats its subject in a manner worthy of the deep professional and general interest held in the welfare of children who are out of harmony with their environment.

SAMUEL W. HAMILTON

Handbuch der Medizinischen Statistik. (Handbook of Medical Statistics.) Vol. I—*By Friedrich Prinzing. Jena: Fischer,* 1930. Price, $4.50.

The first edition of Dr. Prinzing's *Handbook* appeared in 1906. At that time it was the first summary of statistical sources and methods of special interest to the medical profession which had been published in Germany since Oesterlen's Handbook of 1865. There were available, of course, Gottstein's writings (Leipzig, 1897), and Altschul's *Kritische Bermerkungen* (Vienna, 1894), along with one British and one French text; but Prinzing was the first of modern writers to construct a comprehensive classification of statistical subject matters for the medical and public health groups.

The Prinzing classification has remained practically unchanged since 1906 and its influence has been detected in the writings of Scandinavian, German and French medical statisticians.

Prinzing's relation to medical and public health statistics is much the same as von Mayr's and Westergaard's relation to social and economic statistics, or Czuber's relation to the calculus of probabilities. These four great teachers were codifiers of subject matter and method. In the United States the closest approach we have had to Prinzing's scheme has been the works of F. L. Hoffman, R. Pearl and L. I. Dublin. As yet, however, the American school has not produced a text of the dimensions of Prinzing's or of Prinzing's pupils.

By medical statistics, Prinzing means "the precise numerical investigation of pathological phenomena in human society," adopting, in part, Wilhelm Lexis' definition (in his *Theorie der Massenerscheinungen,* . . . Freiburg, 1877). The older definition of Oesterlen (1865) that "medical statistics is the *assembling* of the more important and dependable numerical facts relating to sickness and its prevention," is broadened by Prinzing when he substitutes the concept of "investigation" into causes and relationships for that of mere "assemblage" of facts.

The author also points out the frustration of the hope of medical statisticians of the 60's and 70's of the last century that patient assembly of the statistics would assist in discovering the causes of disease. Bacteriology, bio-

chemistry and experimental physiology, treating the facts of individual case situations, have produced the real advances in preventive medicine.

Save for Budd's statistical investigation of typhoid fever (*circa* 1859), Ross's investigation of malaria (1899 *circa*), Farr's inquiries into cholera (*circa* 1854), little light has been thrown on the proximate-causal factors of disease by statisticians; at least, medical statistics, dealing with aggregates of human beings, have not initiated in any important respect any steps leading to specific and dependable preventive measures. Nor has it been established to the satisfaction of wholesomely sceptical persons that statistics can serve more than superficially in the movement for connecting preventive work as cause with reduced sickness and mortality as effect.

The present work is divided into three major sections: I. Births; II. Human Constitution, Heredity, Defects and Impairments; III. Sickness and Injuries. Under "births," Dr. Prinzing discusses birth statistics as ordinarily understood, legitimate fecundity and the size of families (distinguished from the concept of "fertility"), sterility, miscarriages and abortions, still-births, multiple births, the sex-ratio at birth, and the puerperal state.

Prinzing apparently conceives vital statistics registration to be primarily a function of the administrative-legal branch of government (as it is and has been in Massachusetts since 1631), rather than that of the administrative-public health branch. Vital statistics may quite properly be regarded as a safeguard for human rights in general and not exclusively as a basis for the enforcement of the right to health, however important that may be.

In the "constitution" group (Title II) we find a full classification of medical anthropometry, and also a good discussion of heredity on the pathological side. A summary of the statistical methods and sources on blindness, the deaf and dumb, mental defect, cretinism and various crippling disabilities closes this section. The third "title" in the text discusses morbidity statistics in general, the resources in insurance medical statistics, occupational diseases, injuries in general, mental diseases, venereal diseases, alcoholism and long-term disabilities. The second volume of the text will deal with mortality statistics. We may expect this latter book to appear late in 1930. An English translation would be of service to American students of medical statistics.

E. W. KOPF

Recording and Reporting for Child Guidance Clinics—*By Mary Augusta Clark. New York: The Commonwealth Fund, Division of Publications,* 1930.

This masterly presentation of a most difficult subject is the result of painstaking effort expended over a period of years. The details of service bookkeeping described and recommended represent an evolution of procedure and practice in various clinics throughout this country.

As one who has seen much of the work in manuscript and had occasion to put the instructions into practice, the commentator can testify to the usefulness and practicality of the work. While superficially the details may seem overwhelming almost to the point of confusion, in actual practice one finds that the wording is unusually clear and the principles well defined. If the book is used as it was intended, namely as a guide in establishing a basic procedure, it will be found that the forms and numerous outlines lend themselves to more adaptation than is at first apparent. To one interested primarily in so-called clinical procedures and the individual who comes for treatment, recording and

reporting of statistics is likely to seem something of a burden.

The actual labor involved is much simplified when one has such a guide to help in discriminating between what is likely to prove interesting and instructive and what is relatively less essential. Not the least valuable aspect of such a system is that, since the main body of the outline is used by such a large number of the psychiatric clinics throughout the country, there is furnished a basis for comparison which is very helpful in the discussion of problems of mutual interest between various organizations engaged in child guidance.

The book is exceptionally technical and not deemed to be of popular interest, nor for popular consideration.

The use of the term "sibling" as defined on page 68 is still open to serious question. Although that may appear a convenient definition for use on the case data cards, it is likely to lead to confusion if the word is used in the same sense in the body of the social history, where the name of the patient should be entered in its proper sequence among the other siblings. However, that is a minor point and in no way affects the value of the book.

This publication appears particularly timely when the organization of new child guidance clinics in various localities is so much in the air, and it should without doubt head the list of reference works in any library.

HELEN P. LANGNER

Memories and Vagaries—*By Axel Munthe. New York: Dutton,* 1930. 257 pp. Price, $3.00.

The tremendous success of *The Story of San Michele* has brought about the republication of this book which first appeared in London in 1898. It has had great success, having gone through 12 printings in one month. It is a collection of unconnected short stories, many of which are in the author's best style, while others are disappointing when compared with *The Story of San Michele.* There is evidence of the same love for animals, concern over the fortunes of the working classes, pictures of the cholera epidemic in Naples, etc. We recognize many of the same characters.

Had Dr. Munthe devoted his attention entirely to literature, there can be no doubt that he would have made as much of a success in that field as he did in medicine, though there is little question that he owes the background which is so human and appealing to his intimate acquaintance with the lowly, the sick, and the suffering. A delightful book, full of wisdom and kindliness.

M. P. RAVENEL

Report of Second Conference on the Health and Wealth of Merchant Seamen—*Paris: League of Red Cross Societies,* 1929. 326 pp.

The second conference on the Health and Welfare of Merchant Seamen met at Geneva, Switzerland, October 7–9, 1929, under the auspices of the Norwegian Red Cross and of the League of Red Cross Societies. The conference was attended by delegates from fourteen countries, including all of the major powers. Nine international organizations interested in maritime activities were represented at this conference.

The agenda was divided into three general groups: namely, General Welfare in Ports, Medico-Social Organization, and Welfare at Sea. Discussions under this agenda include 43 papers and numerous communications and reports.

All manner of subjects dealing with the health and welfare of seamen are considered in this report. Generally, much of the discussion is devoted to port facilities which afford medical care and decent living conditions for sailors in port, and which shield them from environmental factors detrimental to their health and morale. These include rec-

reational facilities, the operation of hostels and sailors' homes, admission to local hospitals, and the control of prostitution. The control and treatment of venereal diseases is considered at length.

Several papers are devoted to the health and welfare of the sailor at sea. Consideration is given to his medical care on various types of ships. Such minor subjects as ships' libraries and the organization of sports and games aboard ship are also discussed.

In reading this report one cannot help but be impressed with the coördination of activities and the coöperation obtaining between the various organizations which deal with seamen. If work of this kind can be continued in the future, it is certain to be of great benefit to those who sail the high seas.

Necessarily, many of the papers are presented by title only. Nevertheless, the report contains a number of excellent papers and discussions which are well worth reading by those interested in the health and welfare of merchant seamen.

G. C. DUNHAM

Dietetics in Warm Climates—*By J. Neil Leitch, M.D., B.S. With an Introduction by Brigadier-General Sir J. A. Byrne. London: Robinson & Sons, Ltd.*, 1930.

This is an excellent and comprehensive volume on tropical dietetics, which will be useful to the practitioner in the tropics, the administrator and other residents, or prospective visitors to hot countries.

The wealth of material is divided into 10 chapters, of which the first is the introduction, and the last a discussion of what the future may hold for the health of tropical peoples when the principles of dietetics shall have been applied. The others compose the text, interspersed with voluminous tables of institutional dietaries, as well as tabulations of analyses of food products, etc., derived from government reports, the publications of research organizations, the statements of tropical workers, as well as the personal experience of the author.

The discussion of the physiology of tropical dietaries, the rôle of salts, vegetables and condiments, the various aspects, composition, effects, etc., of tropical dietaries, both native and institutional, as well as the regimen of the bungalow, are especially interesting and comprehensive.

The lists of tropical foodstuffs, their preparation, preservation, and nutritive values, are welcome and of manifest importance, while the chapters dealing with avitaminosis, and the diseases resulting from defective dietaries, food intoxication, fish, meat, and other forms of poisoning are excellent and concise. The author has succeeded in compressing into a small volume a great amount of essential information well selected and logically arranged.

It is a matter for regret that the author found it necessary to distribute advertisements of foods throughout the book in order to defray in part the expense of publication. These are usually full page, and while not detracting from the value of the contents, are not commendable, and are certainly not customary in works of equivalent worth and importance.

The book is well written, the author introducing what may be called local color, and the printing good.

L. C. SCOTT

A Compend on Bacteriology Including Pathogenic Protozoa—*By Robert L. Pitfield, M.D., and Howard W. Schaffer, M.D. Philadelphia: Blakiston*, 1930. 317 pp. Price, $2.00.

This well known compend has reached its 5th edition, which in itself proves that it has been useful.

There are a few omissions which detract from its value, as Dorner's stain for spores and Ponder's for diphtheria,

the two best for their respective purposes of which we know. Gram's stain has also been improved by some modifications which are not mentioned, especially that by Hucker.

It is compact, and the descriptions of fundamental principles are clear. It can be recommended as one of the best in its class. The printing and illustrations are good. M. P. RAVENEL

BOOKS RECEIVED

THE GUIDANCE OF MENTAL GROWTH IN INFANT AND CHILD. By Arnold Gesell. New York: Macmillan, 1930. 322 pp. Price, $2.25.

CLINICAL ALLERGY, PARTICULARLY ASTHMA AND HAY FEVER. By Francis M. Rackemann. New York: Macmillan, 1930. 617 pp. Price, $10.50.

THERAPEUTIC USES OF INFRA-RED RAYS. By W. Annandale Troup. London: Actinic Press, 1930. 56 pp. Price, $1.50.

A BIBLIOGRAPHY OF SOCIAL SURVEYS. By Allen Eaton and Shelby M. Harrison. New York: Russell Sage Foundation, 1930. 466 pp. Price, $3.50.

THROUGH THE ALIMENTARY CANAL WITH GUN AND CAMERA. By George S. Chappell. New York: Stokes, 1931. 231 pp. Price, $2.00.

HOW IT HAPPENED. By Adalbert G. Bettman. Philadelphia: Davis, 1931. 110 pp. Price, $1.00.

TESTS AND MEASUREMENTS IN PHYSICAL EDUCATION. By John F. Bovard and Frederick W. Cozens. Philadelphia: Saunders, 1930. 364 pp. Price, $2.75.

CARE OF THE INFANT AND CHILD. By Harry R. Litchfield and Leon H. Dembo. Baltimore: Waverly Press, 1930. 138 pp. Price, $2.00.

THE REFERENCE SHELF. The Socialization of Medicine. Vol. VII, No. 1, Compiled by Edith M. Phelps. New York: Wilson Co., 1930. 190 pp. Price, $.90.

ANNALS OF THE PICKETT-THOMSON RESEARCH LABORATORY. Vol. VI. London: Pickett-Thomson Research Laboratory, 1930. 470 pp. Price, $10.00.

COMMONWEALTH OF PENNSYLVANIA. Yearbook of the Department of Health, 1929. Harrisburg: Department of Health, 1930. 198 pp.

HEALTH AND LIFE: CONSULTATIONS WITH EMINENT DOCTORS. Edited by Morris Fishbein.
Vol. I. The Skin and Its Function by Morris Fishbein. The Care of the Normal Skin by Wm. A. Pusey. The Care of the Hair by John E. Lane. Your Complexion by Morris Fishbein. The Hands and Finger Nails by Morris Fishbein.
Vol. II. The Periodical Examination by Ray Lyman Wilbur. The Prevention of Heart Disease by William St. Lawrence. Kidney Diseases by William I. Fishbein. Avoiding Anemia by Nina Simmonds Estill.
Vol. III. Foods for Health and Beauty by Morris Fishbein. Beauty Through Diet by Morris Fishbein. Diet for Those over Thirty by John Ruhrah. Tobacco, Coffee, Tea and Alcohol by Morris Fishbein.
Vol. IV. What Expectant Mothers Should Know by Charles B. Reed. Watching Baby's First Years by Julius H. Hess. Fitting my Child Physically for School by Henry F. Helmholz.
Vol. V. The Breast and Cancer. Part I Examination. By Joseph C. Bloodgood. Part II. Diagnosis. The Signs of Tuberculosis by Esmond R. Long.
Vol. VI. The Dread Pneumonia by James B. Herrick. Diabetes: Its Prevention and Treatment by Elliott P. Joslin. Simple Goiter and Its Prevention by David Marine. Rheumatic Ailments by Solomon Strouse.
Vol. VII. Hygiene of the Eye by Harry Gradle. Hygiene of the Nose, Throat and Ear by Wendell C. Phillips. The Truth About the Teeth by Arthur D. Black.
Vol. VIII. Sleep and Health by Morris Fishbein. Baths and Bathing by Morris Fishbein. Exercise for Adults by Morris Fishbein. Personal Hygiene by Morris Fishbein.
Chicago: Manning Publishing Company, 1931. Boards. Price, $.50 each. Set of 8 volumes, $4.00.

LABORATORY MEDICINE. A Guide for Students and Practitioners. By Daniel Nicholson. Philadelphia: Lea & Febiger, 1930. 433 pp. Price, $6.00.

HEALTH DEPARTMENT AND OTHER REPORTS

IRA V. HISCOCK

Detroit, Mich.—November issue of *City Health*, the monthly bulletin of the Detroit Department of Health, is largely concerned with the annual report of the school health service for 1929–1930 and brings out the close coöperation between the Department of Health and the Board of Education. An excellent system of physical examinations, combined with a watchfulness on the part of the teachers, results in the discovery of physical defects in need of remedial action. While all parents are urged to have their own physician examine the child before he enters school, if this is not done, the school physicians give the examination during the first year of school. Also, if any child is 15 per cent underweight, he is given a thorough examination, and the teacher, trained by a series of lectures and demonstrations, reports "defects or indications of defects of teeth, tonsils, palate, cervical, thyroid, skin, orthopedic system, vision, hearing, and for anemia," to the school physicians, who then examine and make the report to the parents.

An educational campaign to urge people to have their children given toxin-antitoxin by their own physician is carried on through talks to the parents at the time an older child is examined, and through newspaper publicity. For the past two years, toxin-antitoxin has not been given in the schools, although vaccination against smallpox is continued, some 52,968 children having been vaccinated in the past year. All children of Detroit are referred to their own physician for diphtheria protection. Since discontinuing this work in schools, an intensive campaign has been waged to have preschool children taken to the private physician. All entering children have as part of their regular history a notation made on their record cards as to their status in regard to diphtheria immunization. If the child has not been immunized, the condition is regarded as a "defect." Every effort is made to have the parents take care of this defect. Of all kindergarten and first grade children, it was found that approximately 30 per cent had received toxin-antitoxin before entering school.

United States Public Health Service—The annual report of the Surgeon General of the U. S. Public Health Service of the United States for the fiscal year 1930 is an impressive volume describing health conditions and activities throughout the world. Through the International Office of Public Hygiene of Paris, the Pan American Sanitary Bureau, and the health section of the secretariat of the League of Nations, there was provided a constant interchange of sanitary information. A relatively favorable year is reported.

Approximately 350 to 400 cases of psittacosis occurred in the winter with a case fatality of 35 to 40 per cent. Cholera was reported in the Philippine Islands in May. In recent years the plague situation has improved, but during the year the disease appeared in African centers near Mediterranean trade routes. Yellow fever was reported from the West Coast of Africa and also from Brazil and Colombia. Smallpox cases were reported in larger numbers than in preceding years in India, England and Wales, and the United States.

In the United States, influenza reached its peak in January. Decreased birth and death rates are recorded over the previous year. Diphtheria showed a gratifying decline—45 states reported

71.4 cases and 6.6 deaths per 100,000 population. Ten years ago, 37 states reported 137 cases per 100,000 with a death rate of 13. The incidence of meningococcus meningitis increased steadily from 1924 to the winter of 1930, but in the spring the number of cases dropped. Pellagra has been increasing for several years and in 1929 the death rate was 5.5. Forty-five states reported 41,458 cases of smallpox in 1929; and for the period 1927–1929, 114,000 cases with 442 deaths. No instance of the importation from abroad of any quarantinable disease occurred during the fiscal year. At domestic ports, 1,211,796 alien passengers and 988,759 alien seamen were examined by medical officers under the immigration laws.

Demonstration projects in rural sanitation were carried on in 202 counties in 24 states.

> While rural health work is applicable to communities in the United States comprising about 60 per cent of our total population, only about 23 per cent of the rural population is so provided. . . . It is the opinion of the Public Health Service and of the state health authorities, as well as of outstanding leaders in the field of public health in our principal educational institutions and elsewhere, that the development of efficient whole-time local health organizations through which all necessary public health activities may be conducted in proper sequence and in proper relation one to the other is the program which will yield a far greater return on the dollar invested in lives saved and sickness prevented among all age groups of both sexes than any program limited to special diseases or to particular elements of the population that has ever been tried out or suggested.

Enlightening accounts are given of investigations of public health problems, of medical services at marine hospitals, of measures for the prevention and control of venereal diseases, and of coöperation with official and unofficial agencies. Attention is called to the opportunities made possible by legislation enacted during the year providing for the creation of the National Institute of Health, with the Hygienic Laboratory as a nucleus. There is authorized an appropriation of $750,000 for the construction and equipment of additional buildings. Additional funds have been made available for the expansion in the cancer and industrial hygiene work.

Pasadena, Calif.—One of the most comprehensive health department reports of the year is that of Pasadena for the fiscal period ending June 30, 1930. An Advisory Committee on Public Health was appointed by the local branch of the County Medical Society at the request of the health officer. Following a list of these members are given the names of the department personnel with their positions. An organization chart of community health agencies, and a classified financial statement prepare the reader further for the body of the report, which follows in outline the *Appraisal Form for City Health Work* of the American Public Health Association. The per capita expenditure by the health department was $.72, while per capita expenditures of other official and voluntary health agencies (including clinics, $.59, and preventorium, $.39) amounted to $1.65.

On the basis of a population of 76,047, a death rate of 12.8 and a birth rate of 14.7 are recorded, while the infant mortality rate was 42.6. There were no deaths from diphtheria, scarlet fever, nor typhoid. Vital statistics tables and effective charts are accompanied by descriptive text.

Early in the spring, acute poliomyelitis appeared in the state, and with the appearance of 2 cases in the city in May, and 25 in June, energies were directed to insure prompt reporting and the collection and early use of convalescent serum. The chief nurse canvassed each case reported during the previous 10 years and attention was

called through the newspapers to the need of serum. Prompt response made possible an ample supply of serum for use locally and in neighboring communities. A 24-hour service was given to physicians by the laboratory and epidemiologist. Cases are charted by weeks, by age, and by months for previous years. "The efficacy of early diagnosis followed by the prompt use of an adequate amount of serum has been apparent throughout this epidemic."

There were 3,076 food handlers examined during the year, in addition to 126 examinations of raw milk handlers and 170 of barbers and beauty parlor operators. Results showed 37 cases of venereal diseases, 5 cases of active tuberculosis, and 4 arrested or suspicious cases of tuberculosis.

The 4 field nurses made 7,844 visits to patients in addition to their infant and preschool conference work, which showed an attendance of 5,349. There were 1,441 vaccinations against smallpox and 1,491 immunizations against diphtheria with which the nurses assisted. A tabulation of laboratory activities, with an appraisal, indicates an unusually effective service scoring 94 per cent. The vital statistics, tuberculosis control, and sanitation services also score over 94, while the total appraisal gives the city 721 out of a possible 1,000 points.

Bridgeport, Conn.—The report of the health department for the year ending March 31, 1930, occupies 91 pages of the *Municipal Register*. In 1929, there were 5 diphtheria deaths as compared with 21 in 1928 and 26 in 1927. The drop is credited to more intensive culturing, the use of only fresh and chloroformed Loeffler's blood serum, and toxin-antitoxin administration. Various educational activities of the year included the showing of 27 films with an attendance of 14,485, and 745 lectures with an attendance of 31,177. Lectures were chiefly on oral hygiene and diphtheria control.

The infant mortality rate in 1929 was 70.9, the outstanding causes of death being prematurity and respiratory diseases. A pulmonary tuberculosis death rate of 44.8 is recorded. After a course of instruction on the structure and function of the eye and in testing of vision, the nurses coöperated with teachers in testing the vision of over 4,000 school children.

A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH. D.

Oral Typhoid Vaccination—Discussing the mechanism of oral vaccination against typhoid fever, the author opens up an interesting field to the student of nutrition.

ARNOLD, L. Biology of Typhoid Fever and Oral Vaccination. Illinois Health Quart., 2, 4: 140 (Oct.–Dec.), 1930.

Prenatal Mental Health—Well worthwhile is this discussion of the mental hygiene of the pregnant woman, about which much remains to be said in the promised succeeding issues.

ARRINGTON, W. W. Mental Health Hints for the Prenatal Period. Pub. Health Nurse, 22, 12: 610 (Dec.), 1930.

Nursing Opportunities in Child Hygiene—The public health nurse of the future, more an educator and less a "nurse," will be the chief factor in the improvement of maternal and infant hygiene, for which we now have sufficient knowledge and the necessary technics.

BOLT, R. A. The Relation of the Nurse to Maternal, Infant and Preschool Health. Pub. Health Nurse, 22, 12: 618 (Dec.), 1930

Milk-borne Disease—Striking indeed is the change in relative position of the enteric diseases and the throat infections in the tabulation of milk-borne outbreaks of disease in New York State during the past 13 years.

BROOKS, P. B. Milk-borne Outbreaks in New York State. New York State J. Med., 30, 23: 1418 (Dec. 1), 1930.

Illnesses Among Wage Earners—A statistical analysis of industrial morbidity data based on absences on account of disability among certain employed groups and persons belonging to sick benefit associations.

BRUNDAGE, D. K. The Incidence of Illness Among Wage Earning Adults. J. Indust. Hyg., 12, 9: 338 (Nov.), 1930.

Mental Hygiene Administration—Mental health problems and the objectives of mental hygiene are presented as a challenge to public health administration in a truly stimulating paper. The public health paper-of-the-month which all sanitarians should read and ponder over.

EMERSON, H. The Mind in the Breaking. Survey Graphic, 65, 7: 366 (Jan. 1), 1931.

Bottle vs. Breast Feeding—During the first quarter of the first year breast-fed babies gain more than bottle-fed infants; after that time the condition is reversed. Infections were generally lower among the bottle-fed group, giving no evidence of increased resistance caused by maternal milk. The authors urge breast feeding for a limited time, when conditions are satisfactory.

FABER, H. K., and SUTTON, T. L. A Statistical Comparison of Breast-Fed and Bottle-Fed Babies During the First Year. Am. J. Dis. Child., 40, 6: 1164 (Dec.), 1930.

Poliomyelitis Statistics—This twenty-odd year statistical study of poliomyelitis in Massachusetts leads to many interesting conclusions. Among others, a striking change in the age grouping since 1918 is shown, the 0–4 age period decreasing markedly with a compensatory increase in the 5–14 year age group.

FORSBECK, F. C., and LUTHER, E. H. Anterior Poliomyelitis in Massachusetts, 1907 to 1929. New England J. Med., 203, 23: 1115 (Dec. 4), 1930.

Duration of Breast Feeding—This seems to be the open season for slogans. The virtues of breast feeding are attacked in this paper, which has the rare merit of being most entertaining—a treat to which the reviewer of health literature is seldom exposed.

GARLAND, J., and RICH, M. B. Duration of Breast Feeding: A Comparative Study. New England J. Med., 203, 26: 1279 (Dec. 25), 1930.

Mottled Tooth Enamel—An interesting study of an outbreak of mottled enamel in the teeth of children who used the offending deep-well water supply during the period of tooth development.

KEMPF, G. A., and MCKAY, F. S. Mottled Enamel in a Segregated District. Pub. Health Rep., 45, 48: 2923 (Nov. 28), 1930.

Venereal Disease Follow-Up—Social service returned old and delinquent cases, brought contacts and sources of infection for examination, accounted for a third of all new admissions, secured coöperation of outside agencies and generally raised the level of clinic service to the community.

LELAND, H. L., *et al.* Does Follow-Up Social Service Pay in a Venereal Disease Clinic? New England J. Med., 203, 24: 1200 (Dec. 11), 1930.

Industrial and Private Medical Practice—To improve the employee's health habits, to protect him from disease and industrial hazards, to have his defects corrected, to provide preventive early treatment and educational services, and to coördinate industrial, private and state medical services is the work of the industrial physician. How organized medicine can further leadership in these activities is the burden of this paper.

SAPPINGTON, C. O., and MARBAKER, N. D. The Industrial Physician and the General Practitioner. J. A. M. A., 95, 26: 1955 (Dec 27), 1930.

Effects of Maternal Nursing—Breast-fed infants grow to be more intelligent, physically superior children, freer from sickness than do those who start life via the bottle route. Animal experimentation and field studies lead the authors to this conclusion, which ought to give comfort to the breast feeding propagandists.

MAURER and TSAI. Diet and Intelligence. Illinois Health Quart., 2, 4: 131 (Oct.–Dec.), 1930.

Taking the Dust Out of Industry—Workers in dusty trades have excessive respiratory disease rates. Although the general tuberculosis rate has been halved, the rate among workers in dusty trades has increased. Other equally arresting findings are discussed.

RUSSELL, A. E. Dust and Pulmonary Disease. J. A. M. A., 95, 23: 1714 (Dec. 6), 1930.

Atypical Dysentery—A mild dysentery-like epidemic disease causing symptoms that simulate food infections was studied and reported upon. The guess was that it might have been caused by an attenuated Shiga type dysentery bacillus.

SPENCER, R. R. An Unusually Mild Recurring Epidemic Simulating Food Infection. Pub. Health Rep., 45, 47: 2867 (Nov. 21), 1930.

Hypertension in Industrial Workers—Arterial hypertension is an important industrial hygiene problem. Limitation of physical effort depending upon the degree of hypertension is advised.

WYCHGEL, J. N. Arterial Hypertension in Industry. J. Indust. Hyg., 12, 9: 319 (Nov.), 1930.

NEWS FROM THE FIELD

Nathan Straus

NATHAN STRAUS, who died on January 11, was born in Rhenish Bavaria, January 31, 1848. He came to America with his family in 1854, and settled in Talbotton, Ga. In 1866 he entered his father's business of importing pottery and glassware. He was also a member of the firm of Abraham & Straus, whose department store is located in Brooklyn; but he retired to devote his time to philanthropic work in 1914. He was president of the New York City Board of Health during 1898.

In 1892, a tragedy in his own family was responsible for the organization of the Straus milk stations, where pasteurized milk was sold to the poor at or below cost. His 2-year old daughter died on a trip to Europe, and it was thought that her death was due to contaminated milk. He began to make a study of methods for keeping milk and distributing it in better condition in order to save the lives of other children. It is said, "He helped three babies to live where only one had survived before."

At different times he has maintained centers for the distribution of milk, coal, food, and ice to the poor in New York City. In 1916 he sold his yacht and gave the proceeds to feed war orphans. In 1918 he started the distribution of pasteurized milk to soldiers and sailors, and in 1920 turned over to the Health Department of New York City his pasteurization laboratory and its equipment to be used for preparing ready-to-drink modified milk in nursing bottles. He was responsible for the first preventorium in the United States in 1909, in the Grover Cleveland cottage in Lakewood, N. J., and when residents of the neighborhood objected, Arthur Brisbane gave 170 acres in Farmingdale, N. J., as a new site, and Nathan Straus gave $50,000 toward the building fund.

In 1904 he first went to Palestine, and shortly thereafter began his work there for, first the sick, old, and blind Jews who had returned to spend their last days there, and then extended his relief work to include those of all races and creeds.

Mr. Straus celebrated his 80th birthday by sending funds to relieve the unemployed in Palestine, and also erected two health and welfare centers for all peoples, one in Jerusalem.

He was presented with the city flag at the Silver Jubilee of Greater New York in 1923 for services rendered during the preceding 25 years.

In 1895, during his early interest, pasteurization was still under suspicion, and politics entered the battle against it. He was indicted by a grand jury on a charge of watering milk. The fact was that his milk stations had diluted milk in accordance with a medical formula, to be fed to infants. It pleased Mr. Straus greatly later to recall this incident when the world was following in his footsteps in health work.

He was the author of many pamphlets on pasteurization. In 1917 his wife, Lina Gutherz Straus, published the book *Disease in Milk—the Remedy Pasteurization. The Life Work of Nathan Straus,* which included articles, reports, and letters by many well known physicians and others on the subjects of pasteurization and preventoriums. Mr. Straus has been a member of the A. P. H. A. since 1903.

SHORT SCHOOL FOR SEWAGE WORKS OPERATORS

A SHORT school for Sewage Works Operators, sponsored by the New York State Conference of Mayors, New York State Sewage Works Association, and the New York State Department of Health, was held at Union College, Schenectady, N. Y., January 26–31, 1931.

The purpose of this short school was to offer intensive training in the fundamentals of sewage disposal and in sewage plant operation by means of lectures, demonstrations, individual laboratory work and discussion.

ANNUAL MEETING OF THE AMERICAN SOCIAL HYGIENE ASSOCIATION

THE annual meeting of the American Social Hygiene Association was held at Hotel Pennsylvania, New York, N. Y., on January 23 and 24.

The subject for the afternoon session on the 23d was "Social Hygiene Educational Campaigns in Chicago and New York." A dinner was held at 7 P.M. and the following speakers took part in the program: C.-E. A. Winslow, Thomas Parran, Jr., Valeria H. Parker, Edward T. Devine, Jay F. Schamberg and Max J. Exner. The annual business meeting was held on the 24th.

SCHOLARSHIPS IN HEALTH EDUCATION

TWO full tuition scholarships of $500 each are available for women in the field of health education at Massachusetts Institute of Technology (Department of Biology and Public Health) for 1931–1932. These scholarships cover the full scholastic year, beginning in September and closing in June.

The scholarships will be awarded on June 26, 1931, and applications should be sent not later than June 1 to the Child Health Education Service of the National Tuberculosis Association, 370 Seventh Avenue, New York, N. Y., for application blanks.

ANNUAL MEETING OF THE JERSEY CITY HEALTH COUNCIL

AT the Annual Meeting of the Jersey City Health Council held January 9, Bernard S. Coleman, Executive Secretary of the Hudson County Tuberculosis League, was reëlected President for 1931. Other officers elected were as follows: Dr. Howard S. Forman, Honorary President; Ira M. Gast, Ph.D., Vice President; Adele McLoon, Treasurer; and Margaret Shea, Secretary.

NEW VENTURE IN MENTAL HYGIENE EDUCATION

THE Massachusetts Society for Mental Hygiene announces that through the generosity of the Godfrey M. Hyams Trust it will begin the publication early in January of a quarterly, *Understanding the Child*. This new magazine will be distributed free to every teacher in the public schools of Massachusetts. Its purpose is to bring to them a knowledge of the principles and practices of mental hygiene.

The Editorial Board for this new magazine will consist of J. Mace Andress, Editor, and Dr. E. Stanley Abbot and Dr. Henry B. Elkind, Associate Editors. There will be a Consulting Editorial Board of fifteen members, composed of experts in the fields of mental hygiene and education.

A small annual subscription fee to the magazine will be charged for those who are not public school teachers in Massachusetts.

WORK FOR THE BLIND

DAVID Resnick has been appointed Director of Publicity for the World Conference on Work for the Blind, which is to be held in New York City

in April, 1931. President Hoover has invited fifty-two nations to participate in this conference.

DR. PETER TO ORGANIZE HEALTH EDUCATION FOR CHINESE GOVERNMENT

AT the invitation of the Chinese Ministry of Health, William W. Peter, M.D., F.A.P.H.A., Director of the Health Service of Cleanliness Institute, New York, N. Y., will go to China some time in February to help organize a national health education program for the Nationalist Government.

The directors of the Association of American Soap and Glycerine Producers, which supports Cleanliness Institute, have granted Dr. Peter 8 months' leave of absence with salary to enable him to undertake this special mission.

ALABAMA DAIRY MARKET SURVEY

L. C. BULMER, Director, Bureau of Food and Dairy Inspection, Jefferson County (Ala.) Board of Health, is directing, in behalf of the Alabama Industrial Development Board, a statewide survey of Alabama Dairy Markets. The twelve largest centers of population are to be embraced in the survey.

BAUSCH MEMORIAL BRIDGE DEDICATION

ON New Year's day, the city of Rochester dedicated its newest and finest span across the Genessee River as the Bausch Memorial Bridge in honor of John Jacob Bausch, the founder of the Bausch & Lomb Optical Company. Mr. Bausch was a pioneer manufacturer of optical apparatus and has helped bacteriologists in this country greatly by his interest in science.

IOWA COUNTY HEALTH WORK

THE State of Iowa is moving forward in the development of its county health work, as evidenced by a recent report which states that Dr. E. R. Coffee of the U. S. Public Health Service has been detailed to the state in connection with county health work for a 2-year period. Full-time health units have already been established in Washington, Woodbury, Des Moines and Plymouth Counties. Two other counties, Johnson and Scott, are ready to organize.

THE PUBLIC HEALTH NURSE

THE *Public Health Nurse* announces a special number on Industrial Nursing, February, 1931.

DR. ADOLF MEYER RECEIVES FIRST AWARD OF THOMAS W. SALMON MEMORIAL

DR. ADOLF MEYER, Professor of Psychiatry of Johns Hopkins University, will receive the first award under the recently established Thomas W. Salmon Memorial. Dr. Meyer was selected in recognition of his distinguished services to psychiatry and mental hygiene over a period of years. The award carries with it an honorarium of $2,500, and the recipient will give The Thomas W. Salmon Lectures during 1931.

PERSONALS

DR. PAUL M. LOWELL, Senior Medical Officer, Food and Drug Administration, U. S. Department of Agriculture, passed away at the Walter Reed Hospital on January 3, 1931.

JAMES CLARKE BRIGGS, of Selma, N. C., who gave his age as 108 years and believed himself to be the oldest physician in the United States, died on January 23, 1931.

DR. ARTHUR D. LITTLE of Cambridge, Mass., a former president of the American Chemical Society, was the recipient of the Perkin Medal, which is awarded annually to the American chemist who has most distinguished himself by his services to applied chemistry.

DR. HUNTINGTON WILLIAMS has been appointed secretary of the State Department of Health, Albany, N. Y., to succeed Dr. Edward H. Marsh. He will also serve as secretary of the Public Health Council.

DR. FRANK E. COUGHLIN has been provisionally appointed epidemiologist in the Division of Communicable Diseases, New York State Department of Health, Albany, N. Y.

DR. JOHN M. T. FINNEY of Johns Hopkins University, Baltimore, Md., and Dr. David Riesman of the University of Pennsylvania, Philadelphia, Pa., will join Dr. Roger I. Lee, consultant in internal medicine, of Brookline, Mass., as consultants of the Committee on the Cost of Medical Care.

E. G. EGGERT, for the past twelve years assistant sanitary engineer of the Texas State Department of Health, has announced his resignation from that office for the purpose of entering private practice, with headquarters in Austin.

DR. OSCAR DOWLING, recent State Health Officer of Louisiana, was killed in a railroad accident on January 2. He was a Charter Fellow of the A. P. H. A.

CONFERENCES

Feb. 16–18, Council of Medical Education and Hospitals of American Medical Association, Chicago, Ill.

Feb. 18, American Conference on Hospital Service, Chicago, Ill.

Feb. 19–21, White House Conference on Child Health and Protection, Washington, D. C.

Mar. 23–27, College of Physicians, Baltimore, Md.

Apr. 2–4, Association of Anatomists, Chicago, Ill.

Apr. 12–15, Tenth Annual Convention, International Society for Crippled Children, Cleveland, O.

Apr. 13–16, American Red Cross, National Convention, Washington, D. C.

Apr. 14–20, World Conference on Work for the Blind, New York, N. Y.

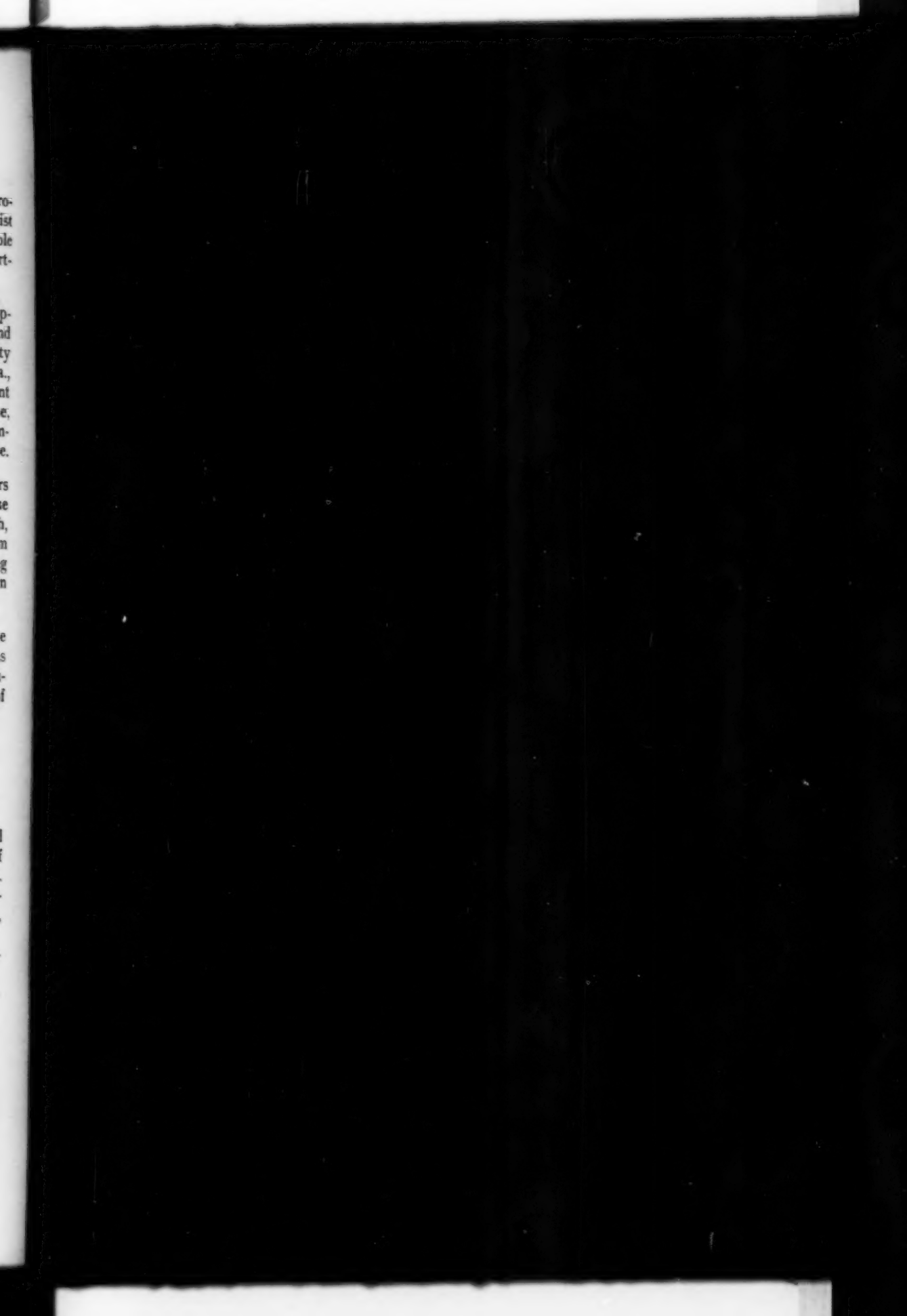
Apr. 29–30, Conference of State and Provincial Health Authorities of North America, Washington, D. C.

May 5–6, National Conference on College Hygiene, University of Syracuse, Syracuse, N. Y.

May 11–14, National Tuberculosis Association, Syracuse, N. Y.

June 1–5, Psychiatric Association, Toronto, Can.

June 1–4, American Federation of Organizations for the Hard of Hearing, Inc., Chicago, Ill.

June 8–12, The American Medical Association, Philadelphia, Pa.

June 14–20, National Conference of Social Work, Minneapolis, Minn.